Understanding Participation in Knowledge-Sharing in Virtual Communities of Practice on the HSELanD elearning Portal

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Declaration

I declare that the work described in this dissertation is, except where otherwise stated, entirely my own work, and has not been submitted as an exercise for a degree at this or any other university.

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Summary

Recognising the value of knowledge as a substantial asset and key resource in the organisation, the Health Service Executive's (HSE) Knowledge Management strategy has introduced the opportunity of participation in VCoPs (Virtual Communities of Practice) to its employees. The sharing of best practices and expert knowledge through inter-professional collaboration is enabled by the medium of Web 2.0 tools, such as blogs and wikis, with forums facilitating discussion on particular topics of interest to contributors. However, successful VCoPs depend on active contribution of knowledge and it appears that these resources are not in general or widespread use, with little participation in knowledge-sharing in evidence. Using a cross-sectional survey, this study aimed to discover the factors which motivate hospital employees and act as barriers to their knowledge-sharing in VCoPs on the HSELanD elearning portal. A questionnaire based on theories of motivation and the technology acceptance model (TAM) enabled data collection from a non-probability, convenience sample of HSE employees at a regional Irish hospital. The majority of respondents in the sample - 72.4 %(n=131) - revealed that they were unaware of the existence of social media to enable knowledge-sharing on HSELanD. Altruistic characteristics were shown to be significant determinants of employees' motivation to share their knowledge, concurring with the findings of previous research. Respondents perceive knowledge-sharing as useful and relevant, regarding reciprocity and recognition by superiors as important factors, while external rewards in the form of opportunities for promotion, financial rewards or chances to show off were reported as the least motivating factors. The lack of time at work to access HSELanD and disinterest in pursuing knowledge-sharing using the portal outside of work time was clearly indicated by responses received. Accessibility and usability issues surfaced also as HSELanD was reported as user-unfriendly and difficult to navigate, with many having problems accessing a computer at work. The training needs of employees to use social media for knowledge-sharing are highlighted by the results of this study, specifically in the area of social media use and respondents indicated a willingness to undertake training and their intention to share knowledge. The self-selection of the respondents, low response rate (12.2%) and the limited representativeness of the sample are acknowledged as limiting the validity and generalizability of the findings. Nonetheless, the findings may offer some guidance to HSELanD management in addressing issues identified by the study and recommendations include ensuring employee awareness of the resources, addressing training needs, reviewing portal usability and providing guidance to professionals regarding social media use in the healthcare environment. Implementation of a "soft reward" system to recognise member contributions and enhance motivation should be considered and consultation with relevant professional managers to achieve a consensus on the development of pro-sharing norms is recommended.

Recommendations

- Ensure that employees are aware of the secure knowledge-sharing resources on HSELanD, for example, by staging nationwide promotional events in hospitals/community health facilities, or disseminating promotional material via internal email, or advertising the resources in relevant publications of interest to health professionals. Use this opportunity to advise employees of the mutual benefits of sharing knowledge and expertise with members of their own profession and with those from other professions.

- Address perceived training needs identified by the study - training to use blogs, wikis and forums. This could be approached by engaging the services of HSE library personnel.

- Review the usability of HSELanD and opportunities for user feedback, taking into account the findings of the study regarding perceived ease of use.

- Provide employees and (potential) contributors to VCoPs on HSELanD with relevant links to guidance from professional bodies regarding social media use (N.M.B.I. 2012), to help allay concerns regarding data protection.

- To help address the establishment of pro-sharing norms, confer with relevant management levels of each professional discipline with the aim of reaching a consensus that time spent on sharing professional knowledge and insights via social media on HSELanD constitutes a valid use of work time, when there is time to do so.

- Consider how to implement some form of 'soft reward' system in order to recognise members' contributions to the virtual communities of practice (VCoPs) on HSELanD, for example, a recognition programme (Paroutis & Al Saleh 2009) where the 'most active forum' or 'top-rated blog posting' is profiled publicly on the individual hospital/facility's newsletters from where the contributions originated. Contributors' perceptions of their knowledge self-efficacy and therefore their motivation could be also enhanced by a personal acknowledgment of their contributions by the VCoP moderators.

- Aimed at creating a sense of community and belonging (Ardichvili 2008), consider incorporating an optional video facility into HSELanD (such as Skype) to facilitate face-to-face interactions in order to address issues around trust and to enable videoconferences.

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Abbreviations

SRH Sligo Regional Hospital

HSE Health Service Executive

WHO World Health Organisation

CoP Community of Practice

VCoP Virtual Community of Practice

KM Knowledge Management

SDT Self-Determination Theory

TAM Technology Acceptance Model

TRA Theory of Reasoned Action

PU Perceived Usefulness

PEOU Perceived Ease of Use

EKR Electronic Knowledge Repository

Glossary

Social media refers to collaborative online applications and technologies which enable people to socialise and to create, share, and exchange information, knowledge and ideas in virtual communities and networks.

A **social networking service** is an online service, platform, or site that focuses on facilitating the building of social networks or social relations among people who, for example, share interests, activities, backgrounds, or real-life connections.

An **Internet forum**, or **message board**, is an online discussion site where people can hold conversations in the form of posted messages.

The word '**blog**' is a contraction of 'Web Log' - blogs are simple content management tools enabling non-experts to build easily updatable web diaries or online journals. Once the blog post has been published on the Web - appearing on screen usually in reverse chronological order - readers can comment on the postings and the author can respond to the comments.

A **wiki** – a Hawaiian word meaning quick - is a collaborative web page comprising the perpetual work of many authors which is open for anyone to add, edit, discuss, and track content and can be used for sharing knowledge.

Web 2.0 refers to a set of technologies and the range of affordances which they permit, including user-generated web content, information and knowledge-sharing/editing, multimedia sharing, online collaboration, participation and social networking.

Listservs are one type of virtual community, and refer to a few early electronic mailing list software applications, allowing a sender to send one email to the list, and then transparently sending it on to the addresses of the subscribers to the list.

Skype service allows users to communicate with peers by voice using a microphone, video by using a webcam, and instant messaging over the Internet.

Chapter 1 Introduction

The global economic downturn of the past few years is reflected in the budgets and fiscal policies of countries world-wide, with Ireland no exception to this development. All public services are affected and this is recognised and acknowledged in the respective service plans pertinent to each service area. In healthcare, increased demand for services exists alongside significant budgetary challenges (HSE 2013), together with substantially reduced staff numbers. Nevertheless, the aim is to continue to deliver a leaner, more efficient, *better integrated* public health service (HSE 2013). It seems reasonable to assume that integration of services could be further supported by enabling collaboration between those employees actually engaged in the provision of these services. The World Health Organisation (WHO 2010) recognises the importance of collaborative practice and encourages health policy-makers to utilise the most appropriate mechanisms to promote its integration with inter-professional education. In order to achieve improved communication between all levels of the health system, policy-makers should create an environment where best practices can be shared (WHO 2010). This is reflected in the provision of "Practice Development Hubs" on the HSE's online elearning portal – HSELanD – which enables knowledge-sharing between employees in Virtual Communities of Practice (VCoPs) through the medium of social media. However, there seems to be little participation in knowledge-sharing by employees in evidence, as the resources – blogs, forums and wikis – are recording minimum usage. This raises questions about the motivation of employees to use this communication resource and whether barriers exist to enabling their participation.

In the healthcare area, Communities of Practice (CoPs) are advocated as vehicles for knowledge creation and sharing (Ranmuthugala *et al.* 2011). A VCoP is a network of people who communicate online about a shared area of interest, resulting in increasing the knowledge of the individuals and adding to the overall knowledge about the area of shared interest (Gannon-Leary & Fontainha 2007). The individuals may be personally unknown to one another and geographically separated. "Web 2.0" refers to the technologies which allow communication, participation, collaboration and editing of information (O'Reilly 2005), and includes forums, wikis, blogs, email and social networking software. Kamel-Boulos & Wheeler (2007) urge the full exploitation of Web 2.0 technologies in the area of health care delivery, for the benefit of health professionals and patients/consumers alike.

Acknowledging the difficulties of motivating individuals to share knowledge, Chiu *et al*. (2006) point out that virtual communities are of limited value if there are no contributions of knowledge.

Wang & Noe (2010) assert that KMS (Knowledge Management Systems) fail to consider how the organisational and interpersonal environment along with individual characteristics affect knowledge sharing. Many of the motivations, barriers and enablers to knowledge-sharing in VCoPs have been identified in the KM (Knowledge Management) literature. These factors may be condensed into three main categories: *personal motivating factors,* such as altruism, knowledge self-efficacy and reputation (Ardichvili *et al*. 2003, Wasko & Faraj 2005, Hsu & Lin 2008) *environmental factors,* such as lack of time and training deficits (Karpinski 2008, Paroutis & Al Saleh 2009) and *technological factors*, such as perceived usefulness and perceived ease of use of the technology (Holzmann & Dubnov 2011, Ketikidis *et al*. 2012). Studies in this area relating particularly to the healthcare environment were found to be scarce, and none were found pertaining to knowledge-sharing in VCoPs in the Irish healthcare context. This lack of information on the topic is regrettable, as it would seem advantageous that HSELanD administration gain some insight into the motivation of employees to share knowledge. Equally important is the need to identify what barriers may be preventing them from doing so, in order to understand how to approach the problem of stimulating knowledge-sharing in VCoPs.

1.1 Conceptual Framework

Existing theories and findings from previous research provide guidance for a study in the form of a conceptual framework (Parahoo 1997). In order to add to the body of existing knowledge of phenomena, it is necessary to know and understand what has already been established, so that a link can be made between the present study and previous work (Parahoo 1997). Theories of motivation and technology acceptance theory provide a framework for the approach taken in this research, while the introduction of the concept of VCoPs requires explanation of their genesis through the lens of the field of Knowledge Management.

This study draws on the principles of Self-Determination Theory – SDT (Ryan & Deci 2000) and Leonard *at al*.'s (1999) Self-Concept Based Motivation Theory to identify individuals' motivation to participate in knowledge-sharing on HSELanD. It uses recommendations based on the TAM - Technology Acceptance Model (Davis, 1989) to identify the ease-of-use and acceptability features of HSELanD offered to its users. **Figure 1.1** illustrates the relationship of these theories with the field of KM in the context of a framework for this study. Edwards (2011) explains the reciprocal relationship between each of the three elements of KM: people, processes and technology in a triangular model, emphasising that the term 'processes' refers to the business processes of any organisation, for example, methods of collaboration for employees. The establishment of VCoPs on HSELanD as a KM initiative is positioned between the 'People' and 'Technology' vertices, showing the proposed influence of the motivational and technology acceptance theories.

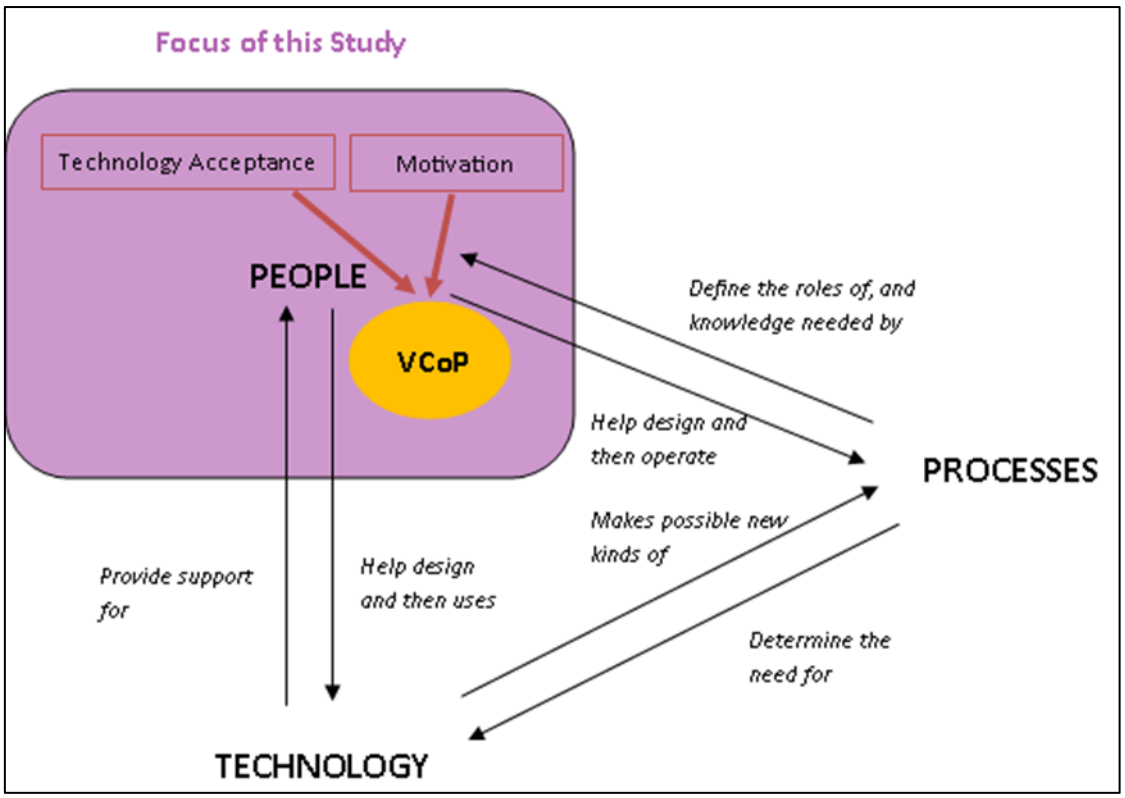


Figure 1.1 People, processes and technology – the elements of Knowledge Management
Source adapted from Edwards J. (2011) A process view of knowledge management: It ain't what you do, it's the way that you do it. *The Electronic Journal of Knowledge Management* **9**(4), 297-306.

1.2 Purpose Statement and Research Questions

Using a cross-sectional survey, this study is an attempt to discover the factors which motivate hospital employees and act as barriers to their knowledge-sharing in (VCoPs) on the HSELanD elearning portal.

Within this overall aim, the study has four specific objectives:

- To conduct a literature review of research into knowledge – sharing in VCoPs and the factors affecting motivation to contribute to and to avail of it.
- To develop instruments to measure the attitudes, beliefs and motivation of HSE employees to participate in knowledge sharing on the HSELanD elearning portal.
- To analyse HSE employees' attitudes, perceptions of access, usefulness and ease of use of the knowledge sharing resources on the HSELanD elearning portal.
- To inform future strategy to support the successful uptake of knowledge-sharing resources on the HSELanD elearning portal.

Research questions

- Are employees aware of the availability of knowledge-sharing opportunities in the "Practice Development Hubs"?
- Would employees feel motivated to share knowledge using social media on HSELanD?
- What do employees perceive to be the barriers to knowledge-sharing on HSELanD?
- Do employees feel confident in the use of the technology provided to share knowledge – blogs, forums, wikis?
- Do employees find HSELanD easy to use?
- Do employees believe that participating in knowledge-sharing in Practice Development Hubs is of value to them in their work?

1.3 The Study Site

As a public facility administered by the HSE, Sligo Regional Hospital employs over 1,400 staff from various professional disciplines: Nursing (department in which the researcher is employed), Clerical/Administration, Health and Social Care Professionals, Support Services and Medical/Dental. With over 300 inpatient and day services beds, acute care is provided to patients from across a range of specialties on a 24 hour, 365 day basis. The hospital is an important regional centre for healthcare in the North-West of Ireland, serving a hinterland with a population of 65,393 (Sligo), 31,798 (Leitrim) and Donegal (161,137), as well as parts of neighbouring counties (CSO 2011). Secure access to HSELanD, the HSE's online learning portal, is available to all employees over the Internet at any time, from any location. The "Practice Development Hubs" within the portal, where employees can share information and knowledge through the use of Web 2.0 tools as members of a VCoP, are password protected, with defined criteria for membership existing for each hub. Employees have access to some or all of the hubs to collaborate and share knowledge, depending on their job role, and participants were recruited from all areas where staff have access to and use HSELanD facilities.

1.4 Overview of the Dissertation

This chapter has presented the background and motivation for the research, the conceptual framework guiding the study, the purpose statement and research questions. The study site has been described, and is followed by a brief overview of the dissertation.

- Chapter 2 presents the first part of the literature review, beginning with an overview of the subject of Knowledge Management, definitions and explanations of terms used within the discipline and contextualising it within the discussion on HSELanD. The next section describes the concept of communities of practice and the enabling technology, followed by an outline of HSELanD – the online learning portal giving access to the VCoPs – and finally elaborates on the motivation for the research study.
- Chapter 3 describes the state-of-the art with regard to literature which examines the influences on participation in knowledge-sharing in virtual communities of practice.
- Chapter 4 explains the research design and methodology. Details of questionnaire development and construction are followed by descriptions of population and the rationale used in sample selection and recruitment. The chapter also deals with the specifics of data collection and analysis, with ethical approval and also explains the research philosophy underpinning the approach taken in this study.
- Chapter 5 presents and discusses the results acquired from the analysis of the survey data. The extent of the motivating factors and barriers affecting knowledge-sharing among employees in VCoPs on the HSELanD portal is detailed in terms of descriptive statistics, with a section reporting the qualitative evaluation of free-text comments by respondents. The last section discusses the results, how they address the research questions and their significance.
- Chapter 6 concludes the dissertation, addresses limitations of the study, and makes recommendations on how the results may inform HSELanD strategy and for future research.

Chapter 2 Background

2.1 Introduction

In order to meet the demanding challenges of integrated, relevant service provision in current straitened times, public healthcare providers are required to find useful solutions for inter-professional collaboration to enable the sharing of expert knowledge (Bentley *et al.* 2010). Opportunities to share best practices through the medium of "Practice Development Hubs" on HSELanD, is one such solution. An examination of the background to this service comprises this chapter, beginning with details of the search strategy used to generate material for the literature review, followed by an overview of the subject of Knowledge Management, definitions and explanations of terms used within the discipline, contextualised within the discussion on HSELanD. The next section describes the concept of communities of practice and the enabling technology, followed by an overview of HSELanD – the online learning portal giving access to the VCoPs – and finally introduces the motivation for the research study.

2.2 Search Strategy

The literature reviewed in this dissertation was sourced by searching online databases of scholarly literature, primarily accessed via Trinity College Library, Dublin and included: PubMed, Science Direct, EbscoHost, IEEE *Xplore* digital library, Emerald, Google Scholar/Books, JSTOR, Lecture Notes in Computer Science, PsycARTICLES and SpringerLink. The following keywords and combinations of same were used: 'knowledge-sharing', 'motivation', 'virtual', 'communities of practice', 'Web 2.0', 'technology acceptance', 'online', 'healthcare' and 'social media', with the search limited to articles in English. Relevant governmental and international publications were consulted and the local HSE library provided access to books in hard copy. Examination of the reference lists of many of the selected articles resulting from the literature search further directed the researcher to review oft-cited pertinent literature.

2.3 Knowledge Management

Research into Knowledge Management (KM) seeks to better understand and exploit the knowledge contained within an organisation (Teece 2000), as the importance of knowledge as a crucial resource and vital strategic asset in organisations is increasingly recognised (Davenport & Prusak 1998).The framework of KM is supported by the theoretical bases of several disciplines comprising of economics, sociology, psychology and philosophy (Anderson & Willson 2009). Utilising resources to increase profit and productivity, while understanding social networks and how knowledge is exchanged, reflect the fields of economics and sociology, respectively. How knowledge is learned, used, shared and created, the mental processes and the human factors

involved, is derived from the psychology domain, whereas the nature of knowledge itself is explained through philosophical principles (Anderson & Willson 2009). Scarborough *et al.* (1999) define KM as any process or practice of creating, acquiring, capturing, aggregating, sharing and using knowledge, wherever it resides, to enhance organisational learning and performance. Many concepts, definitions and views of KM have been presented since the mid-1990s as researchers attempt to identify the key success factors for KM implementation strategies (Nonaka & Takeuchi 1995, Davenport & Prusak 1998). Edwards (2011) acknowledges the relative youth of the KM field and the many areas of disagreement between the different KM specialists presented in thousands of publications. However, the central theme relates to unlocking and leveraging the knowledge of individuals so that this knowledge becomes available as an organisational resource (Anand & Singh 2011). In order to comprehend KM, Anderson & Willson (2009) state that knowledge must be appraised as a "quantifiable manageable asset" and the next section will consider various definitions and characteristics of knowledge pertinent to the KM area of discussion.

2.3.1 Definitions of Knowledge

Knowledge itself is not easy to define, with explanations of the concept offered since at least the era of the Greek philosophers (Anand & Singh 2011). It has been described as an "intangible resource" therefore rendering the process of measurement as challenging (Usoro *et al.* 2007). The Oxford English Dictionary (2013) defines knowledge as "facts, information, and skills acquired through experience or education; the theoretical or practical understanding of a subject", while Davenport & Prusak (1998) describe it as "information in context coupled with an understanding of how to use it". Knowledge may be stored in the human mind, within organisations, in documents and in computer databases **(Figure 2.1)**. Polanyi (1966) originally distinguished between *tacit* and *explicit* forms of knowledge. Tacit (or tactic) knowledge can be understood to mean the beliefs, understandings, skills and practices internal to human beings, which may be difficult to express. It is the implicit, semiconscious and unconscious knowledge held in people's heads (Leonard & Sensiper 1998), the "know-how" attained through learning and experience (Anderson & Willson 2009). Explicit knowledge relates to formal knowledge embedded in written documents or databases (Anderson & Willson 2009), which is "codified and expressed as information in databases and documents" (Skyrme 2011), for example, books, documented best practices, guidelines, formalised standards, facts and rules recorded in either paper or electronic formats. Furthermore, there are distinctions to be made between the concepts of data, information and knowledge – illustrated by the knowledge pyramid or knowledge hierarchy, depicted by **Figure 2.2** (Marco 2003).

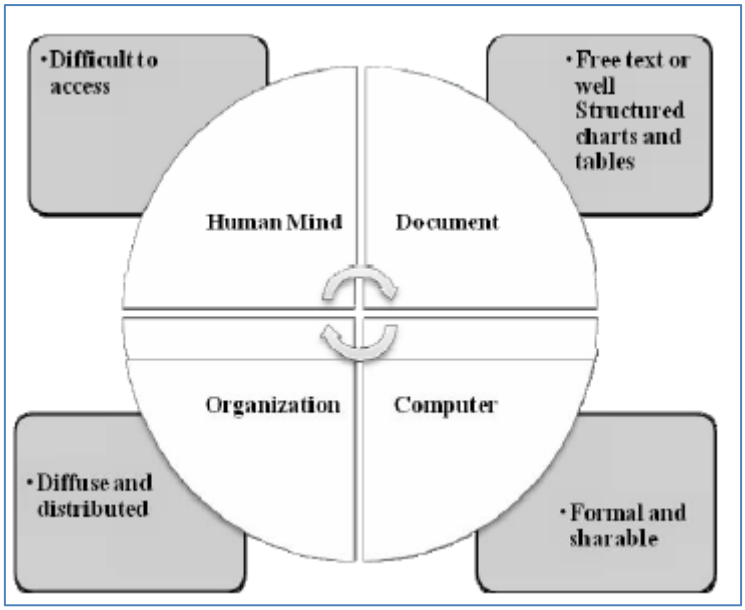


Figure 2.1 Knowledge storage media and its features (Anand & Singh 2011)

Source taken from Anand A. & Singh M.D. (2011) Understanding Knowledge Management: a literature review. *International Journal of Engineering Science & Technology* **3**(2), 926-939.

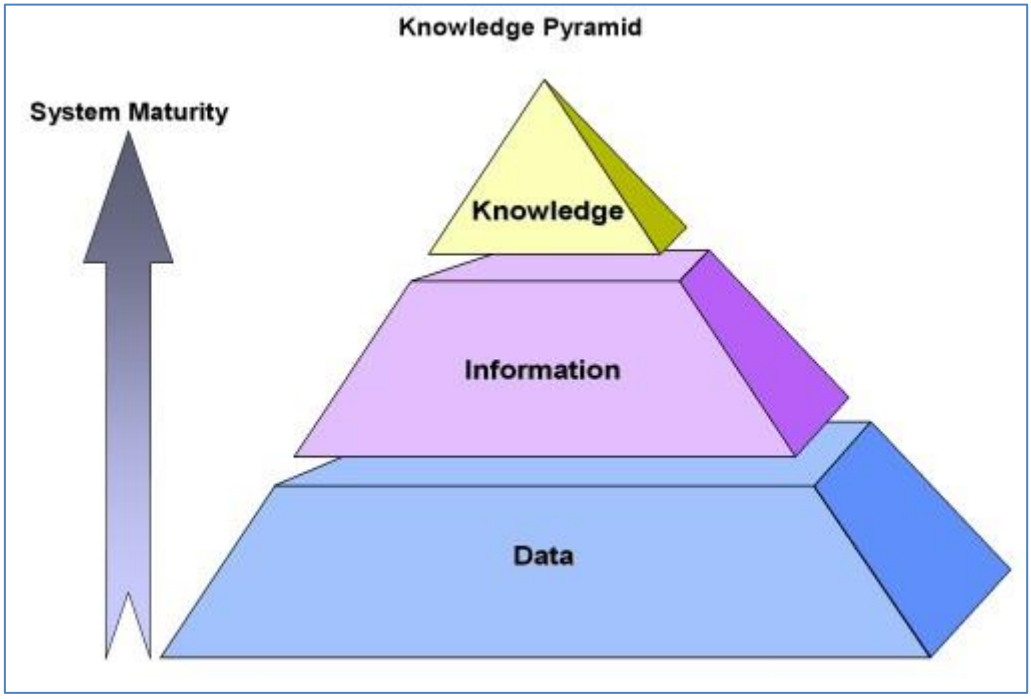


Figure 2.2 The Knowledge Pyramid (Marco 2003)

Source taken from Marco D. (2003) A meta-data repository is key to knowledge management. The Data Administration Newsletter. Retrieved from http://www.tdan.com/view-articles/5064/

2.3.2 The Knowledge Pyramid or Hierarchy

The knowledge pyramid or hierarchy is the most common paradigm found in the KM literature (Davenport & Prusak 1998). Data is transformed into information, which in turn is transformed into knowledge. Usually, the hierarchy is illustrated as a pyramid ascending from data to knowledge; however, an inverted hierarchy has also been suggested by Tuomi (1999) who points out that knowledge precedes the creation of data and information. The pyramid base represents the unprocessed elements of information – the data, which essentially only have meaning when placed in meaningful context (Usoro *et al*. 2007). For example, the numbers 340 and 1845 are merely items of data until the context of an airport timetable transforms them into the information that flight 340 is boarding at 18:45h. This meaningful information, symbolised in the centre of the hierarchy, has transformed into data which has meaning and purpose (Marco 2003). Interpreted in the situation where an intending traveller notes that the current time gives ample time for boarding demonstrates the transformation of information into knowledge. Davenport & Prusak (1998) explain how we transform data by adding value to it in the following ways:

- Contextualized: tells the purpose of gathering the data
- Categorized: gives the units of analysis or key components of the data
- Calculated: tells whether the data was analysed mathematically or statistically
- Corrected: tells us if errors have been removed from the data
- Condensed: tells us if the data was summarized in a more concise form

By this process, data becomes information. Knowledge, at the top of the pyramid, develops as a result of the interpretation of the information, specifically its impact and influence upon and interaction with current knowledge held by the individual (Marco 2003). This may result in the creation and acquisition of new knowledge, demonstrating how information and knowledge inherently enable the process of knowledge-sharing (Usoro *et al.* 2007).

2.3.3 Personal and codified knowledge

Based on the work of Tsui (2003), Hicks *et al*. (2006, p. 21) define knowledge in the KM field into two classes – personal and codified. Personal knowledge refers to that "contained only in the mind of one person" while codified knowledge is that which "has been captured and may be shared". The knowledge hierarchy proposed by Davenport & Prusak (1998) illustrates codified management information systems. Hicks *et al*. (2006) argue that the exclusion of personal knowledge from the hierarchy restricts its usefulness. Their position, reflecting the view of Tuomi (1999), is that personal knowledge, which may contain facts, influences, solutions and innovations, is "in some way the source of all codified data, information and knowledge" (Hicks *et*

al. 2006, p.21). Acknowledging personal knowledge as comprising "half of the foundation of KM", Hicks *et al.* (2006, p.21) go on to point out the obvious difficulties of the capture, storage and inspection of personal knowledge, resident as it is in the mind of the expert. Their conclusion, concurring with Markus (2001), is that information technology merely facilitates explicit knowledge capture and storage, whether acquired by informal communication systems or stored in formal repositories for later reuse. This is the challenge for KM initiatives; whether they are codified systems stressing technology and explicit knowledge or personal systems concentrating on individual knowledge and ways of sharing it, to ensure that valuable personal knowledge can become codified and be therefore retained by the organisation, even when the individual employees are no longer employed. Bate & Robert (2002, p. 649) believe that the effective merging of tacit and implicit knowledge and the necessary conversion and codification of tacit knowledge which enables its "fluidity or transferability across organisational boundaries" to be vitally important to the creation of knowledge. The tacit knowledge conversion process therefore deserves consideration and will be outlined in the next section.

2.3.4 Knowledge Conversion and The Knowledge Spiral

Gubbins *et al*. (2011, p.1) stress that KM initiatives must be effective in enabling the conversion of tacit knowledge into explicit presentations so that "its value can be extracted and captured for use beyond a once off point-in-time social interaction between an individual or collective". How tacit knowledge should be shared; what should be shared through tacit-to-tacit (person-to-person) arrangements and how tacit-to-explicit conversion can successfully operate are challenges faced by KM administration (Skyrme 2011). Nonaka & Takeuchi (1995) proposed two key concepts to firstly help understand the conceptual background of the process of knowledge transformation – knowledge conversion processes and the knowledge spiral.

Knowledge conversion processes

Four types of knowledge conversion processes were described by Nonaka & Takeuchi (1995), which are combinations of conversion of explicit and tacit knowledge. **Figure 2.3** illustrates the conversion of knowledge according to their model. This SECI model (Socialisation, Externalisation, Combination and Internalisation) represents a spiralling knowledge process interaction between explicit and tacit knowledge.

1. Tacit-to-tacit (Socialisation) - knowledge is attained from others through discussion, observation and shared experiences.

2. Tacit-to-explicit (Externalisation) - knowledge is formulated into a tangible form through dialogue and documentation.

3. Explicit-to explicit (Combination) - explicit knowledge, such as that found in documents or databases is combined, for example, categorising best practices.

4. Explicit-to-tacit (Internalisation) – where individuals internalise knowledge from a codified source, for example, from a book, into their own mental models.

Knowledge follows a cycle depicting the 'extraction' of implicit knowledge to become explicit knowledge, with this explicit knowledge becoming 're-internalised' into implicit knowledge (Nonaka & Takeuchi 1995).

The knowledge spiral

Nonaka & Takeuchi (1995) describe how organisational knowledge is created through developments in the knowledge spiral, **(Figure 2.4),** stating that the "mobilisation and conversion of tacit knowledge" is the key to the creation of knowledge. This knowledge creation starts at individual level with the *internalisation* of knowledge through understanding (Skyrme 2011). Individuals discussing their ideas with colleagues represents *socialisation* as the knowledge moves upward through the spiral. As the knowledge is articulated by dialogue and/or documentation, it is *externalised* and *combination* is demonstrated by the consequent diffusion of explicit knowledge. The widening of the spiral reflects the expanding dissemination of the knowledge as it progresses up the spiral, while the application and internalisation of new knowledge by individuals upon accessing organisational knowledge results in this enhanced knowledge, in turn, progressing up the spiral (Skyrme 2011). Thus, according to Nonaka & Takeuchi, (1995), organisational knowledge is created. How this process functions in practice is the subject of the next section.

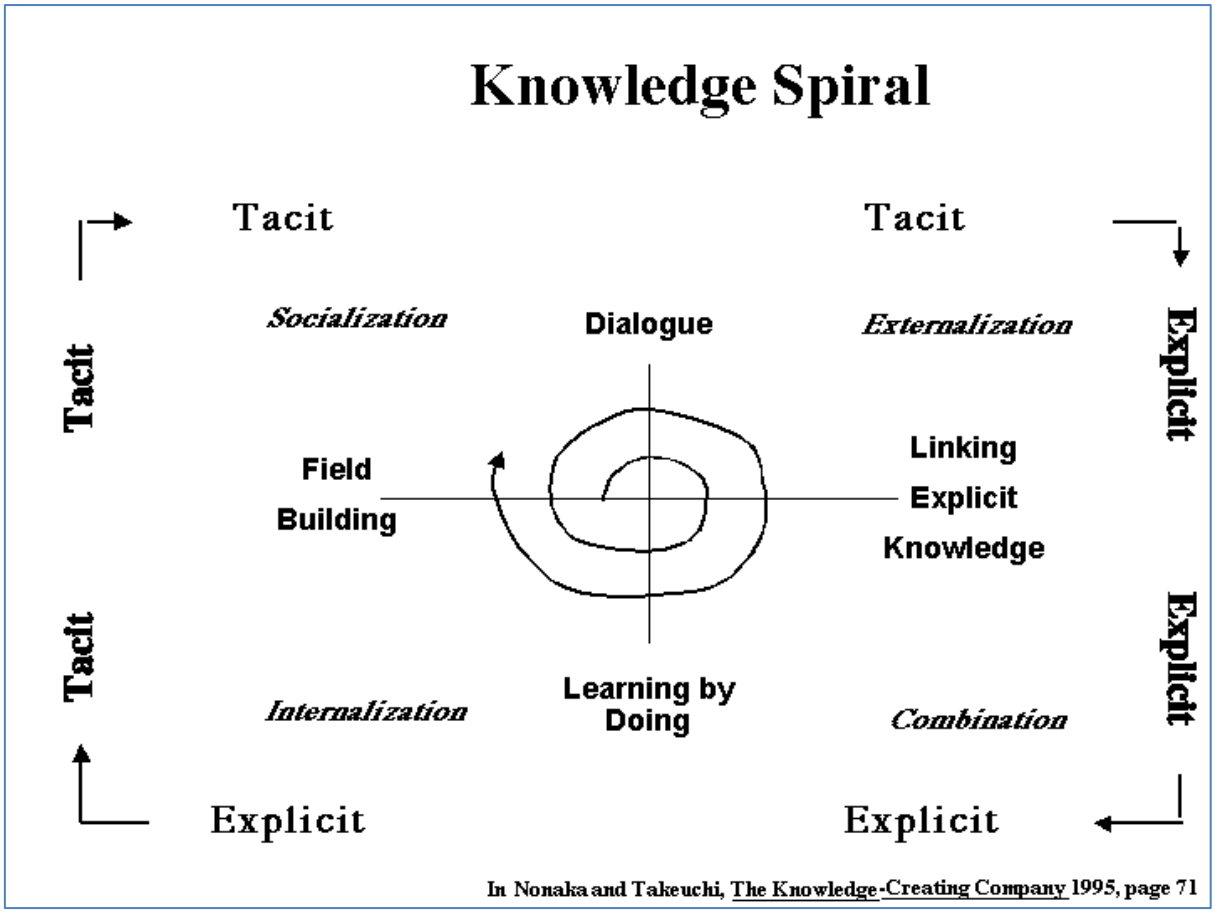


Figure 2.3 Conversion of Knowledge and The Knowledge Spiral (Nonaka & Takeuchi 1995)

Source taken from Nonaka I. & Takeuchi H. (1995) The knowledge - creating company: how Japanese companies create the dynamics of innovation. Oxford University Press, New York.

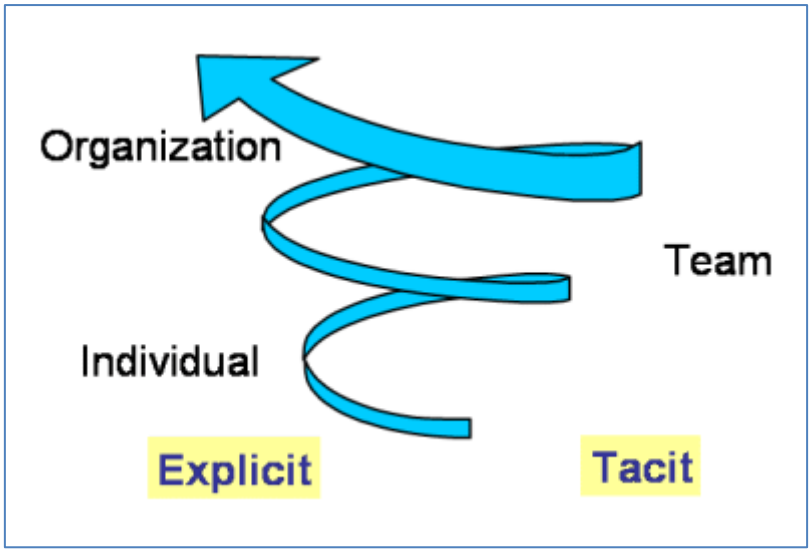


Figure 2.4 The Knowledge Spiral (Skyrme 2011)

Source taken from Skyrme D. (2011) *Knowledge Management.* Retrieved from http://www.skyrme.com/kmbasics/definition.htm on 6th January 2013

2.3.5 The Concept in Practice

Skyrme (2011) offers a useful diagram **(Figure 2.5)** to illustrate the SECI model in practice, using more familiar terminology and corresponding with the numbered stages given above.

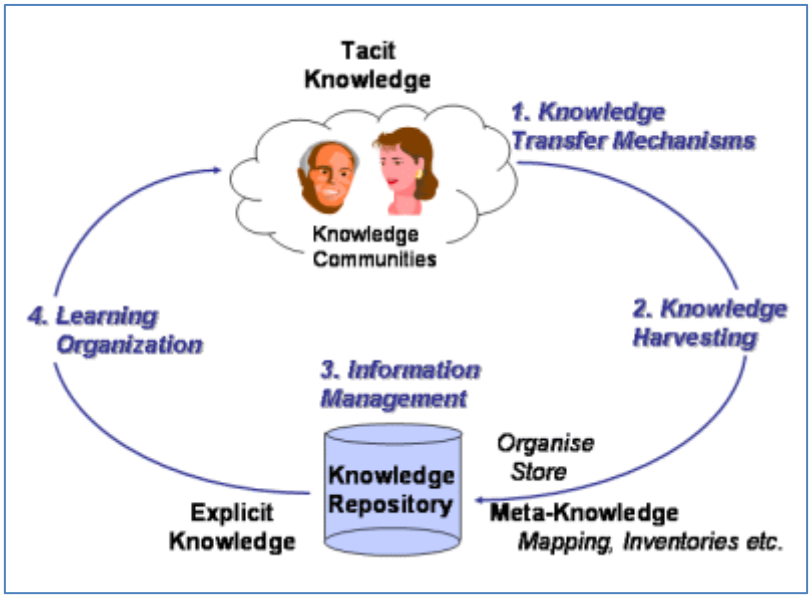


Figure 2.5 SECI model - the concept in practice (Skyrme 2011)

Source taken from Skyrme D. (2011) *Knowledge Management.* Retrieved from http://www.skyrme.com/kmbasics/definition.htm on 6th January 2013

The people within an organisation are the repositories of knowledge held in tacit form, whereas explicit knowledge resides in various sources such as databases and documents. Each of the core knowledge conversion processes require a thorough analysis from the KM perspective in the context of any organisational KM programme implementation so that the most appropriate methods are utilised (Skyrme 2011). Through the creation of the Practice Development Hubs on HSELanD, the HSE has attempted to manage their knowledge resources by offering knowledge - sharing opportunities in the form of virtual communities of practice (VCoPs) to employees who are engaged in strategic areas of healthcare organisation and delivery. The Externalisation / Knowledge Harvesting conversion process (where tacit knowledge is formulated into a tangible form through dialogue and documentation) represents this part of the HSE's KM initiative and forms the basis for the focus of this study. The next section describes the concept of communities of practice and the enabling technology, followed by an overview of HSELanD – the online learning portal giving access to the VCoPs – and finally introduces the motivation for the research study.

2.4 HSELanD and Communities of Practice

Advances in information technology have impacted greatly on management of information, but this does not automatically result in management and transfer of knowledge. As Bate and Robert (2002) reasoned, the existence of a knowledge network does not necessarily mean that there is any occurrence of knowledge flowing. Knowledge-sharing is a process of communication involving a transfer of knowledge between a source and one or more recipients. This communication may be verbal or non-verbal, be enabled by technology or not and may result in the creation of new knowledge (Usoro *et al*. 2007). The challenge therefore, is how to unlock the valuable knowledge trapped inside the minds of key employees (Teece 2000) and how best to use available technology to disseminate it for the benefit of the organisation as a whole.

This challenge has been recognised and embraced by many major companies over the last decade, for example, Ernst and Young's sharing knowledge and best practice initiative and the 'leveraging intellectual assets project' at Dow Chemicals (Quintas 2002). Edwards (2011), on the other hand, refers to many instances from the empirical work of the research teams at Aston University Business School in the UK where the difficulties of implementing KM strategies in organisations have been revealed. These examples range from successful implementation to initiatives with little or no impact, and where a successful KM strategy has either come to a halt or cannot get started at all. Edwards (2011) concludes that there is no "one size fits all" solution - no single way that knowledge management can be successfully implemented in an organisation. Through the creation of the "Practice Development Hubs" on HSELanD, the organisations' online

learning portal (HSE 2011), the HSE has attempted to manage their knowledge resources by offering knowledge - sharing opportunities using social media in the form of virtual communities of practice (VCoPs) to its employees. This is the level of KM described by Skyrme (2011), who refers to KM programmes which are focussed at an "Enterprise" level, i.e. across the organisation, giving intranet portals and communities of practice as examples.

2.4.1 Communities of Practice

The concept of communities of practice (CoPs) is widely discussed in the fields of knowledge management, organisational learning and education (Cox 2005). Wenger *et al*. (2002, p.4) define communities of practice as

"… groups of people who share a concern, a set of problems, or a passion about a topic, and who deepen their knowledge and expertise in this area by interacting on an ongoing basis."

Problem-solving and the sharing of insight, advice and information characterise their interactions with each other, even though they may not work together every day (Wenger *et al.* 2002). Examples of CoPs include the cavemen of prehistoric times discussing hunting strategy, the artisan guilds of the Middle Ages and the clubs and work/school groups we may belong to in modern life (Wenger *et al.* 2002). In the context of intentionally created CoPs within organisations, Garavan *et al*. (2007) state that the benefits to the organisation includes improved access to knowledge and creation of a potential source of ideas for new products and services. Ardichvili *et al*. (2003) suggest that the intangible and tacit nature of much of an individual's knowledge lends itself well to the medium of CoPs to enable sharing of the knowledge. Facilitating employees to talk about their experiences and therefore share and internalise tacit knowledge, seems therefore to be a practical solution (Ardichvili *et al*. 2003), with online CoPs made possible by internet technologies further expanding the scope of the possibilities for knowledge-sharing. Developments in technology have been the main drivers in the transformation of the traditional community structure based on physical proximity, personal and family relationships or business associations to communities which exist based on common interests, need and goals (Holzmann & Dubnov 2011). This technology is in the form of Web 2.0 and the types of communities thus enabled are virtual communities.

2.4.2 Virtual Communities of Practice (VCoPs)

Virtual Communities of Practice (VCoPs) are the expansion of Wenger *et al*.'s (2002) model of CoPs to the virtual world (Palmisano 2009), aided by the development and extensive availability of the Internet as a fast, flexible and cheap communication environment (Gouvea *et al.* 2006). Forums, wikis, blogs, email and social networking software are the technologies used to facilitate the methods of interaction between the members of the VCoPs, who may well be personally unknown to each other and geographically separated. A term created by O'Reilly Media (O'Reilly 2005), "Web 2.0" refers to these technologies which allow communication, participation, collaboration and editing of information – often called the "social web" (Paroutis & Al Saleh 2009). Any user may create, assemble, organise, share and locate content, emphasising the importance of participation for successful operation (Kamel Boulos & Wheeler 2007). Wikipedia, "the free encyclopaedia that anyone can edit" (Wikipedia 2013), is a good example of Web 2.0 in action, embodying the result of the collaborative efforts of contributors who participate in the creation and updating of knowledge. The harnessing of Web 2.0 technology within organisations has become known as Enterprise 2.0 (McAfee 2009) when organisations adopt its tools and approaches to encourage participation in communities which produce useful information and knowledge. Eysenbach (2008) refers to the use of Web 2.0 technologies within the healthcare context which enable and facilitate social networking, participation and collaboration as 'Medicine 2.0' applications. According to McAfee (2009), the benefits of Enterprise 2.0 are available to any organisation, not being confined to the corporate environment, and the development of VCoPs within HSELanD reflects the HSE's recognition of these opportunities. An overview of HSELanD will be presented in the next section.

2.4.3 HSELanD

HSELanD is an online learning portal which was developed by the Health Service Executive (HSE) as a pilot project in 2005 and has been fully functioning in its current format since 2007. It is available to all healthcare workers in the Irish Republic, including the HSE, Voluntary Hospitals and associated Non-Government Organisations working in health and allied disciplines, providing online courses and learning resources for healthcare workers in both hospital and community health settings. Access to the learning portal is available over the internet, on a secure site, and may also be accessed on the HSE intranet. Offering over 60 e-Learning programmes covering the clinical, managerial and personal domains, the portal also gives access to online learning resources including reports; publications; e-videos; links to websites; online libraries; personal development, leadership and management resources; and organisational development learning resources (Mc Hugh *et al*. 2012). Learners can also take part in informal learning, social learning

and collaborative learning via the practice development hubs and through using the Web 2.0 social media available in HSELanD. The hubs reflect specific content areas and facilitate knowledge sharing between multidisciplinary groups spread throughout Ireland. These are shown in the screenshot depicted in **Figure 2.6** and include:

- The Change Hub (offers practical assistance and advice on managing change)
- The Integrated Discharge Planning Hub
- The Health and Social Care Professionals Hub
- The Nursing and Midwifery Leadership Hub
- The Learning & Development Specialist Network Hub
- The Quality and Patient Safety Hub

Defined criteria for membership exist for each hub, with password protected access ensuring a secure environment for information and knowledge-sharing. Each of these hubs features social learning resources including forums, wikis, blogs, internal messaging, user profiles and videos. Employees have access to some or all of the hubs to collaborate and share knowledge, depending on their job role, e.g. The Integrated Discharge Planning (IDP) Hub, which supports staff with a responsibility to implement IDP regionally and locally. Support for collaborative practice is evident with the development of the The Health and Social Care Professionals Hub. These employees have an opportunity to collaborate online regardless of geographical location, to exchange resources and advice and provide support to each other (Mc Hugh *et al*. 2012), in effect, to participate in a virtual community of practice. Hub users are encouraged to:

- Locate others who are applying similar skills
- Share best practices
- Discuss obstacles and solutions to application, and foster collaboration
- Link learners before and after a formal training event
- Build, embrace and promote an interconnected culture. (HSELanD 2013)

Figure 2.6 Screenshot of Practice Development Hubs on HSELanD

Source taken from HSELanD (2013) *Practice Development Hubs on HSELanD.* Retrieved from http://www.hseland.ie/tohm/portal/cop.asp on 13 January 2013

HSELanD activities and developments are aligned closely with the corporate objectives of the HSE and the portal enables timely response to urgent training needs as they are identified. In 2009, for example, vital training for all healthcare workers was needed urgently due to the outbreak of Pandemic H1N1. A training programme to address this need was developed and released on HSELanD within eight weeks and over 1,800 staff were able to access this online training in the first month (Liston 2010). Significant cost savings have been achieved by the health service through enabling employees to study online, thereby avoiding travelling expenses (Liston 2010).

2.5 Motivation for the study

As of March 2012, HSELand had over 50,000 registered users to date and almost 7,500 Practice Development Hub registrations - the latter representing approximately 5% of all health service employees (Liston, 2012, personal communication). Overall, HSELanD user numbers indicate a 300% increase since 2008. Despite this positive trend, the online resources for collaboration and knowledge-sharing in the VCoPs (forums and blogs) do not appear to be in general or widespread use. The Change Hub Blogs, for example, have remained static since 2010, with no new blog entries and no employee having commented on the blogs posted. Similarly, the forums are inactive on this hub, with a comparable situation existing for all the VCoPs on HSELanD (HSELanD

2013), implying that there is little participation in knowledge-sharing in evidence. This raises questions about the motivation of employees to use this communication resource and whether barriers exist to enabling their participation. The National Manager for eLearning in the HSE has expressed concern on this under-utilisation of the learning hubs in HSELanD, and provides the motivation for this study (Kenny, 2011, personal communication).

2.6 Conclusion

This chapter has introduced the subject of Knowledge Management, specifically in the context of HSELanD, the online learning portal provided by the HSE for employees. The concept of communities of practice as a virtual entity has been described, followed by an overview of HSELanD, which enables access to the VCoPs and the motivation for the study is explained in the final section. The next chapter therefore presents the state-of-the art with regard to literature which examines the influences on participation in knowledge-sharing in virtual communities of practice.

Chapter 3 State-of-the-art

3.1 Introduction

According to Drucker (1993, p.7), neither capital, natural resources nor labour comprise the basic economic resource – "it is and will be knowledge". How knowledge can be leveraged as a valuable productive asset is the economic challenge facing organisations as they try to manage this crucial resource. Bolger (2009), in her study of the viability of VCoPs in the Irish Civil Service, acknowledges the different KM challenges faced by private sector versus public sector organisations, explaining that the drivers and motivations of sales targets, profit objectives and bonus possibilities are not the norm for employees in public sector environments. Nevertheless, concurring with Drucker (1993), she posits that the knowledge held in public sector organisations should be recognised as its most valuable asset and goes on to recommend VCoPs as a method of fostering employee development and learning while retaining vital organisational knowledge. Given that much of the organisational knowledge in question is located in tacit form within employees' minds and the apparent lack of activity in VCoPs on HSELanD, it is essential that HSELanD administration gain some insight into the motivation of the employees to share knowledge. Equally important is the need to identify what barriers may be preventing them from doing so. Elsewhere within the HSE, the Nursing Information Research Exchange (N.I.R.E. 2013), which is a web based nursing information and continuing education resource, also offers discussion forums to support knowledge-sharing, communication and collaboration between professionals. Similarly, this resource appears to be under-utilised, with minimal activity on the forums in evidence. This chapter will present findings from the literature which helps to understand why users join and contribute to VCoPs and what the determinants of knowledge-sharing are in these environments.

3.2 Factors affecting participation in VCoPs

Many of the motivations, barriers and enablers to knowledge-sharing in VCoPs have been identified in the KM literature (Ardichvili *et al*. 2003, Wasko & Faraj 2005, Ye *et al*. 2006, Wang & Lai 2006, Lin 2007, Moore & Serva 2007, Usoro *et al*. 2007, Ardichvili 2008, Roca & Gagne 2008, Liao *et al*. 2009, Paroutis & Al Saleh 2009, Fang & Chiu 2010, Yu *et al*. 2010, Holzmann & Dubnov 2011, Xie *et al*. 2011, Vuori & Okkonen 2012, Papadopoulos *et al*. 2012), as outlined in **Table 3.1**. Other authors include the role of technology acceptance as an influencing factor (Hsu & Lin 2008, Kim 2012, Wang *et al*. 2012). These factors could be condensed into three main categories: *personal factors, environmental factors* and *technological factors*. Based on the literature review and adapted from the work of Holzmann & Dubnov (2011), a model is presented to depict the

factors affecting the participation of employees in VCoPs **(Figure 3.1).** The VCoP is represented in the centre of the model, surrounded by the three categories of influencing factors as identified in work published by all of the above authors. Motivation, defined as the desire, willingness or enthusiasm to do something (Oxford Dictionary 2013), has been recognised as one of the critical success factors in VCoPs as it relates to the motivation of members, or potential members to participate in knowledge-sharing activities (Ardichvili 2008). Davis (1989) suggested that perceived usefulness and perceived ease of use impacts significantly on a users' motivation to accept and use information technology. This chapter will introduce theories of motivation and goes on discuss technology acceptance theory. Each of the main categories of influencing factors on knowledge-sharing and their components will be reviewed and examined in the remaining sections of this chapter, with reference to theories of motivation and technology acceptance as appropriate.

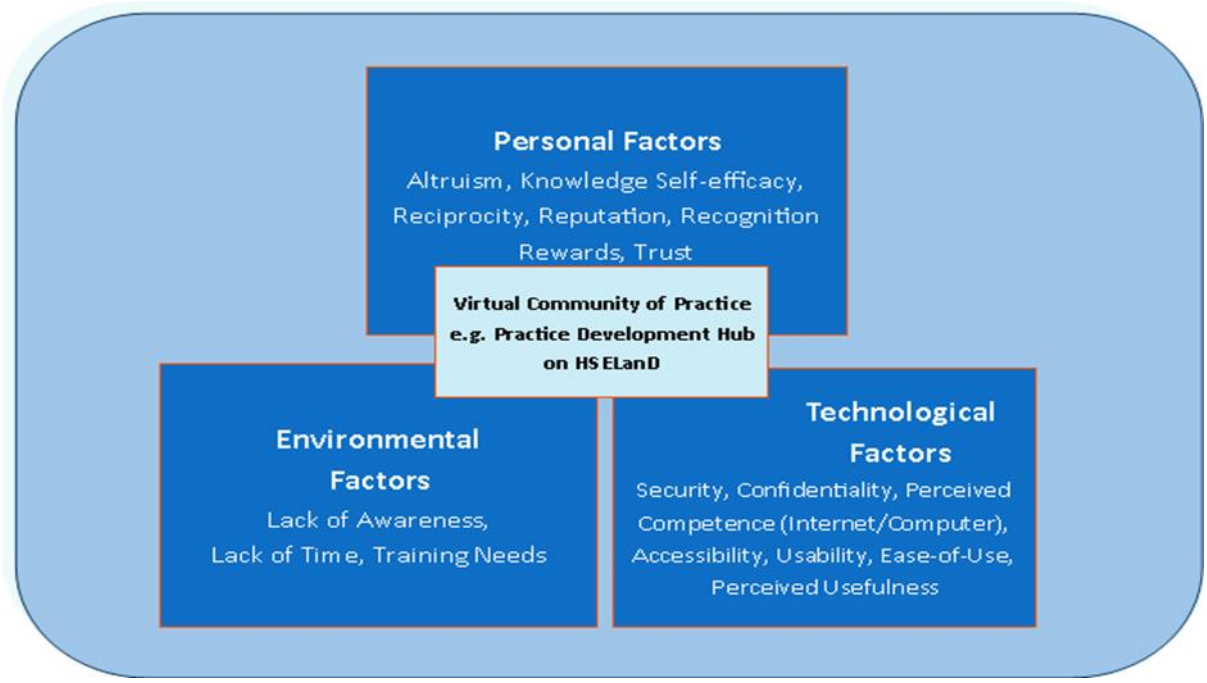


Figure 3.1 Factors affecting participation in VCoPs

Source adapted from Holzmann V. & Dubnov S. (2011) Understanding the Collaboration Enigma. *International Journal of Knowledge, Culture and Change Management* **10**(7), 69-81.

Motivational / Barrier/ Enabling Factors	Sources
Altruism	Ardichvili et al. 2003, Wasko & Faraj, 2005, Ye et al. 2006, Lin, 2007, Moore & Serva, 2007, Hsu & Lin, 2008, Paroutis & Al Saleh, 2009, Fang & Chiu, 2010, Yu et al. 2010, Vuori & Okkonen, 2012.
Knowledge Self-Efficacy	Ardichvili et al. 2003, Wasko & Faraj, 2005, Wang & Lai, 2006, Ye et al. 2006, Lin, 2007, Liao et al. 2009, Xie et al. 2011.
Reciprocity	Lin, 2007, Moore & Serva, 2007, Paroutis & Al Saleh, 2009, Vuori & Okkonen, 2012.
Reputation	Wasko & Faraj, 2005, Moore & Serva, 2007, Hsu & Lin, 2008, Paroutis & Al Saleh, 2009.
Recognition	Ardichvili et al. 2003, Paroutis & Al Saleh, 2009, Holzmann & Dubnov, 2011, Vuori & Okkonen, 2012.
Self-Esteem	Ye et al. 2006, Moore & Serva, 2007.
Rewards	Liao et al. 2009, Paroutis & Al Saleh, 2009, Vuori & Okkonen, 2012.
Trust – Benevolence based	Ardichvili et al. 2003, Ye et al. 2006, Usoro et al. 2007, Ardichvili, 2008, Liao et al. 2009, Paroutis & Al Saleh, 2009, Fang & Chiu, 2010.
Trust – Competence based	Ardichvili et al. 2003, Ye et al. 2006, Usoro et al. 2007, Ardichvili, 2008, Karpinski, 2008, Liao et al. 2009, Paroutis & Al Saleh, 2009, Fang & Chiu, 2010.
Trust – Institution based	Ardichvili et al. 2003, Usoro et al. 2007, Ardichvili, 2008, Liao et al. 2009, Fang & Chiu, 2010.
Relationships Expectation	Paroutis & Al Saleh, 2009, Vuori & Okkonen, 2012, Papadopoulos et al. 2013.
Lack of Awareness of Resource	Karpinski, 2008, Paroutis & Al Saleh, 2009,
Lack of Time	Karpinski, 2008, Paroutis & Al Saleh, 2009, Vuori & Okkonen, 2012, Papadopoulos et al. 2013.
Training	Ardichvili, 2008, Paroutis & Al Saleh, 2009, Xie et al. 2011.
Perceived Competence-Internet/Computer	Roca & Gagne, 2008, Wang et al. 2012.
Accessibility	Holzmann & Dubnov, 2011, Vuori & Okkonen, 2012.
Perceived Ease-of-Use	Ye et al. 2006, Hsu & Lin, 2008, Roca & Gagne, 2008, Holzmann & Dubnov, 2011, Kim, 2012, Vuori & Okkonen, 2012, Wang et al. 2012, Papadopoulos et al. 2013.
Perceived Usefulness	Karpinski, 2008, Roca & Gagne, 2008, Paroutis & Al Saleh, 2009, Yu et al. 2010, Lau, 2011, Xie et al. 2011, Kim, 2012, Vuori & Okkonen, 2012.
Security / Confidentiality	Ardichvili et al. 2003, Paroutis & Al Saleh, 2009.

Table 3.1 Factors affecting participation in Virtual Communities of Practice

3.3 Theories of Motivation

3.3.1 Self-Determination Theory

Ryan & Deci (2000, p. 54) state that being motivated "means *to be moved* to do something". In their Self-Determination Theory (SDT), two main classifications of motivation have been described by Ryan & Deci (2000) – *intrinsic* and *extrinsic* motivation – based on the different reasons which result in an action. Intrinsic motivation refers to the satisfaction, enjoyment and pleasure resulting from engaging in an interesting activity, while extrinsic motivation focuses on goal-driven incentives e.g. rewards or benefits, or the avoidance of a punishment. Particular importance is attached to understanding how intrinsic motivation can be supported, given that it results in high-quality learning and creativity (Ryan & Deci 2000). SDT posits that satisfying the basic psychological needs for *autonomy, competence* and *relatedness* enhances intrinsic motivation. The need for *autonomy* refers to the desire of an individual to be free to determine their own behaviour and actions – the need for self-determination. *Competence* – defined as the ability to do something successfully or efficiently (Oxford Dictionary 2013) implies the need for individuals to feel successful in mastering their environment and in performing an activity (Deci & Ryan 1985). Cognitive Evaluation Theory (CET)(Deci & Ryan 1985), described as a sub-theory of SDT - argues that intrinsic motivation is facilitated for an action when an individuals' *feelings of competence* are augmented by rewards, communications and feedback, thereby satisfying the basic psychological need for competence. According to Ryan & Deci (2000), it is necessary for people to experience perceived competence and to also feel that their actions are self-determined if their intrinsic motivation is to be positively affected. The need for *relatedness,* as understood in SDT, refers to a sense of belongingness and security engendered by feeling supported and connected to significant others, such as a peer group, managers or society. Satisfying this need may therefore prompt the performing of externally motivated behaviours, which in themselves may be innately uninteresting, but whose execution may be valued by those significant others (Ryan & Deci 2000).

SDT further expands on the processes by which extrinsically motivated behaviours can become more self-determined – *Internalisation* and *Integration.* Internalisation is defined as taking in values or regulations to oneself, while integration refers to the process by which individuals assimilate these values or regulations to become reflected as their own (Ryan & Deci 2000). The range of ones' motivation for behaviour is conceptualised by Deci & Ryan's (1985) 'Taxonomy of Human Motivation' – **Figure 3.2**. This interpretation describes how motivation for behaviour can vary between amotivation, to passive acquiescence, to active personal commitment (Ryan & Deci 2000).

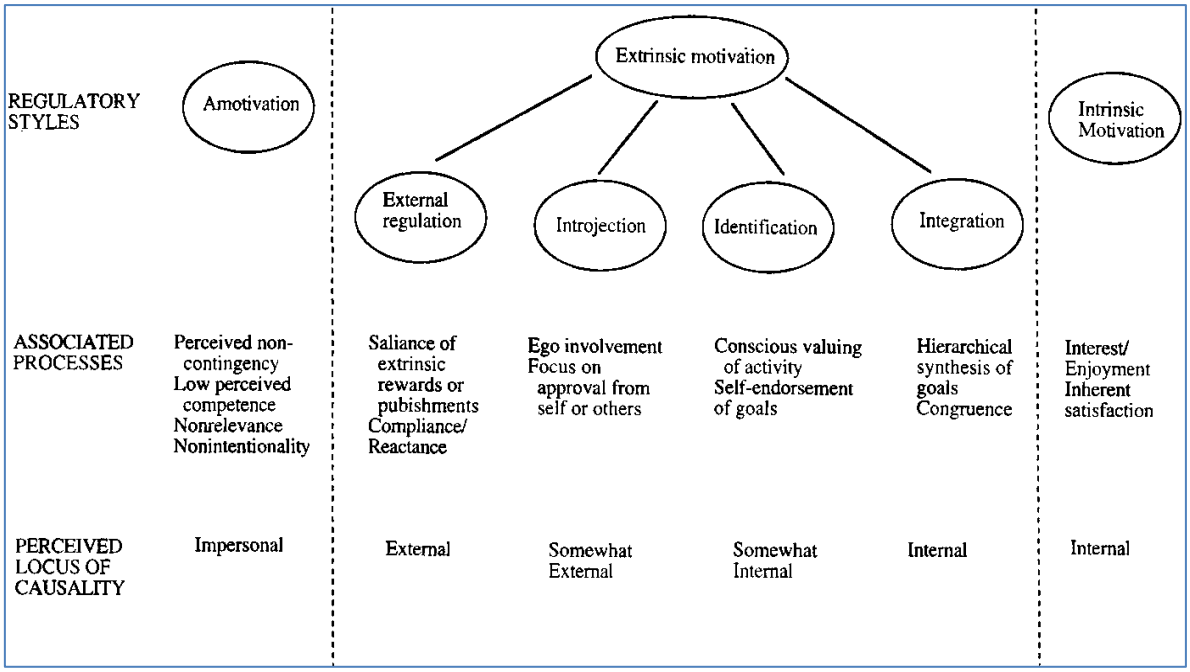


Figure 3.2 A Taxonomy of Human Motivation (Ryan & Deci 2000)

Source taken from Ryan R.M. & Deci E.L. (2000) Intrinsic and Extrinsic Motivations: Classic Definitions and New Directions. *Contemporary Educational Psychology* **25,** 54–67.

Amotivation, the state of lacking an intention to act, (Ryan & Deci 2000), may result from not valuing an activity (Ryan 1995). *External regulation*, representing the least autonomous form of extrinsic motivation, refers to performing an activity which results in reward or avoidance of sanction. *Introjection* denotes the performance of actions accompanied by feelings of pressure, guilt and shame or to enhance ego, implying that the value has been accepted but not assimilated as integral to oneself. *Identification* describes the acceptance of a behaviour as relevant, valuable and of personal importance to an individual. Ryan & Deci (2000) give the example of a child memorising spellings because realising the importance for writing results in identification with the value of the learning activity. *Integration*, the most autonomous form of extrinsic motivation, occurs when the values and regulations associated with particular behaviours have been fully accepted and assimilated as congruent with one's own perspective. Thus, externally motivated behaviours and actions become self-determined as the reasons for these actions are internalised. Nevertheless, integrated forms of motivation remain distinct from intrinsic motivation, placed at the far right of Figure 3.1. Individuals engage in behaviours for instrumental reasons, for example, personal goal achievement, with the former, whereas with the latter, a behaviour is engaged in out of enjoyment (Roca & Gagne 2008).

Ryan & Deci (2000) do not suggest that their continuum explaining external motivation types implies that individuals must progress through different stages of internalisation of behaviours as in a developmental scale, rather, one can adopt a behaviour at any point along the continuum depending on the context of the situation and previous experiences (Ryan 1995). However, they do assert that individuals need to understand a goal or activity and possess relevant skills to engage in it to increase the likelihood of adoption and internalisation. Therefore, they recommend that supports to enhance competence should be available to promote internalisation, which, in the case of HSELanD, could well mean ensuring that employees have access to relevant information and training. Ryan & Deci (2000) also suggest that autonomy support is required to facilitate internalisation. An autonomy-supportive style of management implies that choices and options are offered to employees with provision of relevant information and rationale for engaging in the activity (Roca & Gagne 2008). Ryan & Deci (2000) cite a study by Deci et al. (1994) which confirmed that when significant justification was provided for an uninteresting behaviour in an autonomy and relatedness supportive environment, this fostered internalisation and integration. Implications for HSELanD management suggest an emphasis on making relevant information available to provide the rationale for engaging in knowledge-sharing and on addressing the issue of the need for relatedness to enhance intrinsic motivation in employees.

3.3.2 Self-Concept Based Motivation Theory

Leonard *at al*. (1999), while acknowledging the validity of intrinsic process motivation, extrinsic motivation and goal internalisation as sources of work motivation and accepted among researchers to date, proposed the addition of the *self-concept* as a source of motivation. They argued that the established motivation theory could not fully explain the range of behaviours exhibited by employees. Self-concept has been defined as a person's mental model of his or her abilities and attributes (Gerrig & Zimbardo 2002), or a collection of beliefs about oneself (Leflot *et al*. 2010). From this perspective, Leonard *et al*. (1999) purport that individuals have a set of perceptions about their traits, competencies and values – their *perceived self.* The set of traits, competencies and values they would *like to possess* comprise their *ideal self.* A further set of self-perceptions is embodied in the individuals' *social identities,* where individuals locate or define themselves within their social environment, for example as a 'man', or 'scientist', or 'Hindu' (Leonard *et al*. 1999). Traits are labels used to describe recurring behaviours, for example, out-going, talkative or generous, while competencies refer to the individuals' "perceptions of what skills, abilities, talents, and knowledge they possess" (Leonard *et al*. 1999, p.975). Values are defined as principles or standards of behaviour (Oxford Dictionary 2013) and the values held by

an individual are expressed through what they say and do (Leonard *et al*. 1999). Feedback from an individuals' environment regarding their traits, competencies and values, be it verbal or non-verbal, praise or reprimand, influence the development of their self-perceptions, which may be strongly or weakly held as a result. The self-concept develops due to the interaction between the perceived self, the ideal self and social identities (Furman 2008). According to Gecas (1982), individuals are motivated to sustain the internalised view of oneself as their self-concept continues to mature. Based on their interpretation of self-concept, Leonard *et al*. (1999) proposed two types of self-concept based motivation: *external self-concept based* and *internal self-concept based motivation.* Thus their theory put forward the following five sources of work motivation:

1. Intrinsic process motivation – the workers' motivation for the task comes from the enjoyment of performing the task; it is perceived as fun. Ryan & Deci (2000) similarly identified a construct of their SDT – 'intrinsic motivation'.

2. Extrinsic/Instrumental Motivation – the individual is motivated by external rewards, for example, bonuses or compensation. Again, this concept is discussed as 'external motivation' in the work of Ryan & Deci (2000).

3. External Self-Concept-Based Motivation – the motivation to do certain things is dependent upon the positive feedback received from being part of, or associated with a particular group. Those driven by this motivation relate group success with their competencies and capabilities, especially when they believe success or failure is directly associated with themselves, as their reputation is one of the driving forces of this form of motivation (Leonard *et al*. 1999). This is a similar construct to 'Relatedness' – the basic psychological need identified by Ryan & Deci (2000) in SDT.

4. Internal Self-Concept-Based Motivation – The individual is motivated to pursue activities which provide them with positive feedback about their traits, competencies and values. The personal belief that their efforts result in successful outcomes is more important than public acknowledgement for their endeavours.

5. Goal Internalisation - individuals motivated by goal internalisation pursue the goals of their team, group or organisation because they personally believe in the attainment of these goals. Commitment to achieving their organisations' values and goals, which they have internalised as their own, is the driving force behind this type of motivation (Leonard *et al*. 1999), with personal acknowledgement or credit for their efforts not

regarded as important. This construct resembles the description of 'Integration' as explained in SDT by Ryan & Deci (2000).

Snyder & Williams (1982) assert that human beings have a basic need to maintain or enhance their self-concepts and therefore their behaviour is motivated accordingly. The two theories of motivation described above - SDT and Self-concept-based motivation theory – have many similarities and may go some way towards explaining the motivation of HSE employees to participate in knowledge-sharing on HSELanD. As user acceptance of technology has also been identified as a factor affecting participation, the next section will present technology acceptance theory.

3.4 The Technology Acceptance Model – TAM

The achievement of organisational goals, such as successfully operating VCoPs within the KM domain, can be hampered by low acceptance of health information technology (HIT) and can partially account for the success or failure of such initiatives (Ketikidis *et al.* 2012). Understanding the reactions, acceptance and usage of these technologies by the individual users is critical and of significant relevance to the organisation (Money & Turner 2004, Ketikidis *et al.* 2012). The participation of employees in VCoPs requires user interaction with technology - the tools and applications which are available to enable communication and collaboration. The TAM proposed by Davis (1989) to explain technology acceptance by end users was based on an adaptation of the theory of reasoned action (TRA) (Fishbein & Ajzen 1975). **(Figure 3.3)**

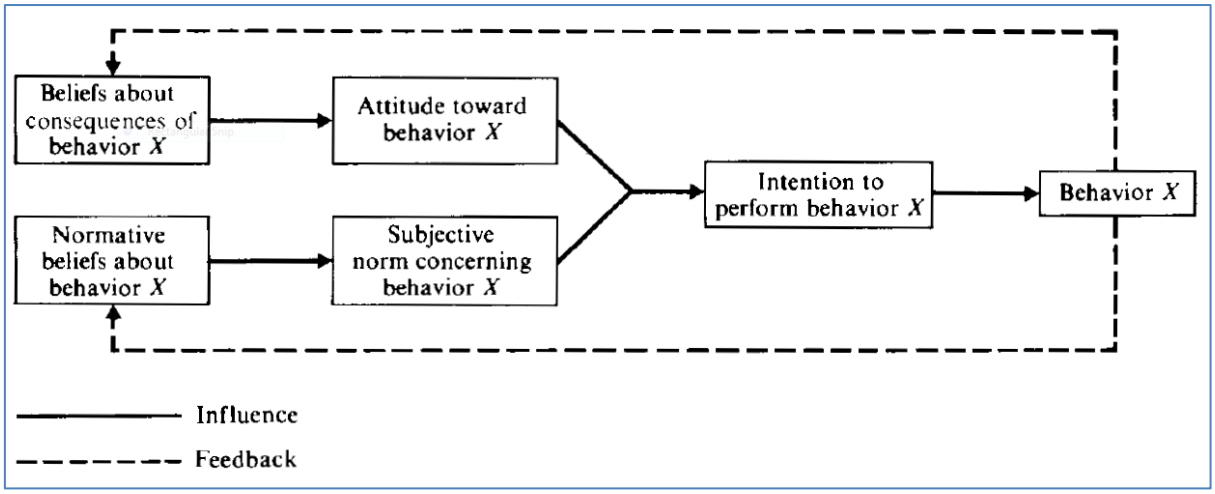


Figure 3.3 The Theory of Reasoned Action (Fishbein & Ajzen 1975)

Source taken from Fishbein M. & Ajzen I. (1975) *Belief, attitude, intention, and behavior: an introduction to theory and research.* Addison-Wesley, Reading, MA. Retrieved from http://home.comcast.net/~icek.aizen/book/ch1.pdf on 15th January 2013

The TRA posits that people make their decisions rationally, considering the potential costs and benefits associated with their behavioural options (Ketikidis *et al.* 2012). The *attitudes* held by an individual, *social norms* and *intentions* are central to this theory. The expectancy that a behaviour will lead to particular outcomes contributes to forming the attitudes toward its performance, while social/subjective norms represents the perceived pressure felt by an individual to conform to the expectations of others (Ketikidis *et al.* 2012). Therefore the intention to perform a behaviour is influenced by both the attitude of the individual and the subjective norms in his environment (Hsu & Lin 2008). While the TRA is a non-specific model with regards to any particular behaviour, Davis, (1989), in application of the rationale of the TRA, reasoned that individuals' intentions to use IT applications are driven by their attitudes towards the applications. In turn, according to Davis (1989), attitudes are formed by the beliefs of individuals about the perceived usefulness (PU) and perceived ease of use (PEOU) of the technology in question **(Figure 3.4).**

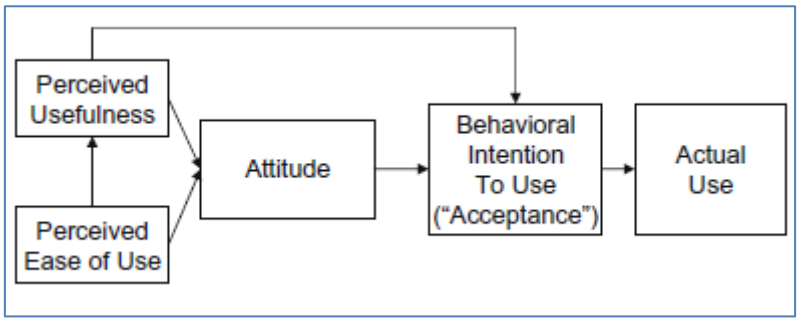


Figure 3.4 The Technology Acceptance Model (Holden & Karsh 2010)

Source taken from Holden R.J. & Karsh B.T. (2010) The Technology Acceptance Model: Its past and its future in health care. *Journal of Biomedical Informatics* **43**(1), 159–172.

Davis (1989, p. 320) defined perceived usefulness (PU) as "the degree to which a person believes that using a particular system would enhance his or her job performance". The user believes that using the system can be advantageous with positive outcomes. Perceived ease of use (PEOU) relates to "the degree to which a person believes that using a particular system would be free of effort" (Davis, 1989, p. 320), with the ease of using an application influencing the likelihood of its acceptance by users. The TAM was amended by Venkatesh & Davis (2000) following a review of research findings which indicated the lesser importance of 'attitude' as a construct. The adjusted model, known as TAM2, retained PU and PEOU as they were found to be relevant determinants of intentions to use technology (Ketikidis *et al.* 2012). While 'attitude' was omitted, 'subjective norms' was an added variable – referring back to the TRA, this refers to the effect of the views and judgements of colleagues or superiors on the individual's use of an IT system. The importance

of the system in everyday use at work and in the workflow of the individual was reflected in the addition of 'job relevance' as a construct. Therefore subjective norms and job relevance were presented as predictors of PU, together with PEOU, with the addition also of 'output quality' and 'results demonstrability of IT applications' comprising the final TAM2 **(Figure 3.5).**

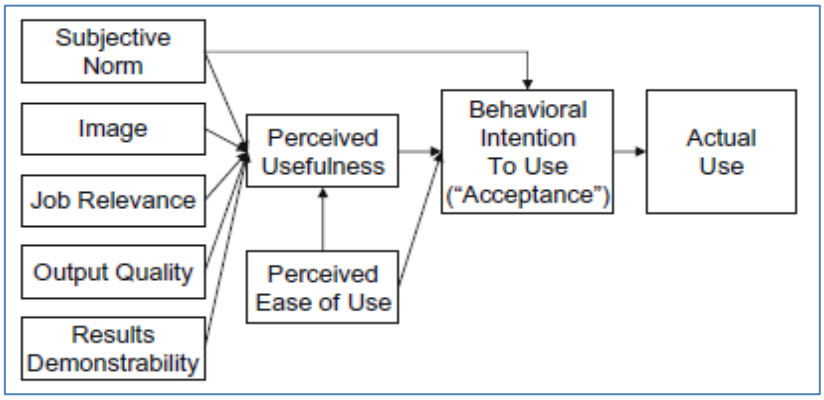


Figure 3.5 TAM 2 The Technology Acceptance Model (2) (Holden & Karsh 2010)

Source taken from Holden R.J. & Karsh B.T. (2010) The Technology Acceptance Model: Its past and its future in health care. *Journal of Biomedical Informatics* **43**(1), 159–172.

The role of technology acceptance in explaining participation in online communities or VCoPs has been explored in the literature (Hsu & Lin 2008, Kim 2012, Wang *et al*. 2012) and these authors have included such variables as 'social factors', 'intrinsic motivation' and 'internet self-efficacy' in adapted models in order to expand the predictive power of the TAM. **Figure 3.1** depicts the factors affecting the participation of employees in VCoPs, showing the factors condensed into three main categories: *personal factors, environmental factors* and *technological factors*. Each of these categories and their components will be reviewed and examined in the remaining sections of this chapter, with reference to theories of motivation and technology acceptance as appropriate.

3.5 Participation in Knowledge-sharing in VCoPs

3.5.1 Personal Factors

3.5.1.1 Altruism

Altruism, the 'selfless concern for the well-being of others' (Oxford English Dictionary, 2008), refers to the voluntary acts of assistance performed by people at some personal cost, in order to benefit others (Fang & Chiu 2010). In VCoPs, people voluntarily give of their time and effort in the form of knowledge-sharing – thereby helping others to profit from their knowledge and experience. Davenport and Prusak (1998, p. 31) regard altruism as a significant driver for knowledge-sharing and altruism has also been identified by Wasko & Faraj (2005) as an important

stimulus of knowledge contribution in electronic networks of practice. Ardichvili *et al*. (2003) found that employees viewed their knowledge as a public good belonging to the organisation, as opposed to belonging to the individual, resulting in knowledge exchange motivated by feeling morally obliged to contribute for the good of the community.

Altruistic motives – helping the organisation and enjoying helping others - were also found to be the foremost influences by Vuori & Okkonen (2012) in a study which examined the motivational factors affecting knowledge-sharing using an intra-organisational social media platform. Ye *et al*. (2006), in a study which examined knowledge-sharing in VCoPs, concluded that enjoyment in helping others is a key driver of knowledge-sharing intention, concurring with the findings of Kankanhalli *et al.* (2005), Lin (2007) and Moore & Serva (2007). Enjoying the sharing of experiences and knowledge with others and an interest in helping to solve their difficult problems was also noted by Wasko & Faraj (2000) who undertook a study to examine why people participate and share knowledge in electronic CoPs.

Hsu & Lin (2008) explored the motivation of people to use blogs by developing a model which incorporated the TAM with motivational factors. Findings were in line with the above, with people shown to actively participate in blogs because they enjoy helping each other and have a concern for the welfare of others, suggesting the important role of intrinsic motivation as a driver. Similar results were also presented by Yu *et al.* (2010) in a study of factors influencing knowledge-sharing behaviour via blogs, although their online survey sample was drawn from a list of current active online community members in Taiwan. This could limit generalizability to other settings/populations, for example to non-users, given that the altruistic motivation of respondents had resulted in actual contribution/participation.

A qualitative case study research design was employed by Paroutis & Al Saleh (2009) to investigate the participation of employees in collaboration and knowledge-sharing in a multinational technology and services corporation. Users of the social software provided were motivated to share knowledge for altruistic reasons - enjoyment of helping others – however, it was noted that contributors felt discouraged from participation if they felt that others were not benefitting from their contributions. This was easily evidenced by blogs receiving no hits or comments, or wikis where the perception was that one was the solitary contributor. This is significant in the context of HSELanD, where this very situation exists in terms of inactivity on the VCoPs, and highlights for management the importance of recognising and supporting the altruistic motives of employees to share knowledge for the benefit of the organisation.

3.5.1.2 Knowledge Self-Efficacy

The concept of self-efficacy refers to one's belief in their capability to some degree to exert control over their own actions and environmental events, in other words, their confidence in their capability or power to undertake certain performances (Bandura 2001). Knowledge self-efficacy was shown by Kankanhalli *et al*. (2005) to be positively related to knowledge contribution in an organisation, as it reflected the confidence people had in their ability to contribute useful knowledge and therefore their increased motivation to do so. Wang & Lai (2006) and Liao *et al*. (2009) demonstrated perceived self-efficacy to be a significant influence in studies which examined knowledge contribution intention in an online virtual community and via blogs (Papadopoulos *et al.* 2012). This concurs with Wasko & Faraj (2005), who also found that the professional experience of contributors had a significant influence on willingness to contribute knowledge. The perceived capability and competence of potential contributors was also found to be an important barrier to their participation in virtual knowledge-sharing CoPs in a study by Ardichvili *et al.* (2003). Participants expressed doubt about the accuracy, importance and relevance of their own contributions, linked to a fear of losing status or misinforming colleagues. These barriers were, by contrast, found to be insignificant in the study by Vuori & Okkonen (2012) referred to earlier.

Knowledge self-efficacy was also identified as a significant motivational factor associated with knowledge-sharing intentions in a study by Lin (2007), while the prevailing influence of enhanced knowledge self-efficacy on knowledge contribution intention was demonstrated by Ye *et al.* (2006). A survey questionnaire which was returned by 363 virtual community users (response rate 72.6%) was employed by Ye *et al*. (2006), who acknowledged that study limitations include the fact that their sample was comprised primarily of university students with over 50% aged between 21 and 25. Generalizability of their results to settings within organisations was recognised as contingent on replication in these settings, as their study concerned members who had joined virtual communities outside their organisation.

Referring back to Leonard *et al.'s* (1999) Self-Concept Based Motivation Theory, individuals are motivated by Internal Self-Concept-Based Motivation in their pursuit of improved perceptions of competency. The individual is motivated to pursue activities which provide them with positive feedback about their traits, competencies and values and which enhances their self-perceptions and therefore the development of their self-concept. The studies reviewed suggest the considerable influence of an individual's perceived competence – their knowledge-self-efficacy in this case – on their intention to contribute knowledge in VCoPs.

3.5.1.3 Reciprocity

Reciprocity is defined as the practice of exchanging things with others for mutual benefit (Oxford English Dictionary 2013). Schumaker & Brownell (1984), as cited by Wasko & Faraj (2005), state that reciprocity behaviour may generate a sense of mutual indebtedness, usually encouraging individuals to reciprocate the help they may have received from others. The motivation of external rewards when participating in a certain activity, for example, bonuses or compensation, is discussed as external or instrumental motivation by Leonard *et al.* (1999) and by Ryan & Deci (2000). Lin (2007) showed that reciprocal benefit was a strong motivational factor for employee knowledge sharing intentions, a finding shared by Moore & Serva (2007), who studied member motivation for contributing to virtual communities. A strong sense of reciprocity was found to facilitate knowledge-sharing in electronic networks of practice (Wasko & Faraj 2000), suggesting that knowledge contributors continue their efforts when they trust in some form of reciprocity. Vuori & Okkonen (2012) also showed that people were willing to share knowledge on an intra-organisational social media platform if knowledge was shared with them in return. Trusting in the reciprocal actions of other employees and their provision of help when needed were concerns highlighted as barriers to knowledge contribution to Web 2.0 platforms by Paroutis & Al Saleh (2009).

However, studies have also shown the relationship between reciprocity and knowledge-sharing intention to be inconsistent, in that individuals contributed their knowledge without expectation of direct help in return (Kankanhalli *et al*. 2005, Wasko & Faraj 2005, Ye *et al*. 2006). Wasko & Faraj (2005) offer an explanation for this in terms of what they call generalised reciprocity. The individual contributing knowledge to an electronic network of practice may receive feedback from a third party, not necessarily from the individual who may have requested help, and this may satisfy the motivation of reciprocal benefit. Kankanhalli *et al.* (2005) further elaborated on this in their study which showed that in a climate of collaboration and cooperation, knowledge contributors to electronic knowledge repositories are not motivated by reciprocity concerns. Reciprocity benefit is identified as an important motivator, however, in environments where pro-sharing norms are not established.

3.5.1.4 Reputation

The importance of reputation to contributors - the widespread belief that someone or something has a particular characteristic (Oxford English Dictionary 2013), in motivating knowledge-sharing has been identified in several studies (Wasko & Faraj 2005, Moore & Serva 2007, Hsu & Lin 2008, Paroutis & Al Saleh 2009). Enhanced reputation by participating in an electronic network is suggested by Wasko & Faraj (2005) who cite Blau's (1964) social exchange theory as the basis of

this belief. An expectation of social rewards such as approval, status and respect as a result of social engagement prompts individuals to participate, according to this theory. Being motivated by the perception that professional reputation and status is enriched by contributing valuable, personal knowledge to others was hypothesised by Wasko & Faraj (2005) and shown to substantially influence knowledge contribution. Reputation as a motivator of contribution to a wiki and a forum was demonstrated to be an important driver of user contribution by Moore & Serva (2007), while Hsu & Lin (2008) found that earning an online reputation by knowledge-sharing on blogs was desirable to the respondents in their study. Paroutis & Al Saleh (2009) referred to 'building a level of credibility' related to the specific employee, in their study results of employees' motivations to contribute knowledge to Web 2.0 platforms. Other motivators identified in this study included the possibility of expansion of the employee's social and professional networks, with possible further opportunities to enrich reputation.

3.5.1.5 Recognition

Wasko & Faraj (2000) found that when knowledge contribution behaviour was felt to be status and reputation-enhancing and to improve career prospects, individuals were active contributors to electronic CoPs. Ye et al. (2006) showed that this perception of enhanced self-image was a significant predictor of knowledge contribution intention in virtual communities, while fulfilment of self-esteem needs was shown to be a motivation to contribute knowledge to an internet forum by Moore & Serva (2007). Employees were willing to contribute knowledge to VCoPs borne out of the need for recognition as an expert through their contributions in a study by Ardichvili et al. (2003). Motivation, reflecting personal gain as important, was also found by Holzmann & Dubnov (2011), whose respondents cited the wish to be respected for their work, as a motive for collaboration in a virtual community. In their study of determinants of knowledge-sharing using Web 2.0 technologies, Paroutis & Al Saleh (2009) observed recognition to be a key influential factor. The recognition of their contributions by superiors, with acknowledgement of their particular input was viewed as important by respondents, whose credibility and expert status was further enhanced by this recognition. This finding was echoed in the work of Vuori & Okkonen (2012) whose respondents considered 'praise and words of thanks from the superiors' as motivational in the use of an inter-organisational social media platform.

Reputation and recognition as motivational factors in the contexts described above seem to fit with the constructs of External Self-Concept-Based Motivation (Leonard *et al.* 1999) and relatedness as described by Ryan & Deci (2000) in their respective motivational theories. The motivation to do certain things is dependent upon the positive feedback received from being part

of, or associated with a particular group, with reputation being one of the driving forces of this form of motivation (Leonard *et al*. 1999).

3.5.1.6 Rewards

Leonard *et al.* (1999) and Ryan & Deci (2000) discussed the concept of external/instrumental motivation where individuals' behaviour is driven by the incentives of a reward, for example, tangible, hard rewards such as bonuses, or non-monetary inducements such as enhanced job prospects or possible promotion. Kankanhalli et al. (2005) used survey methodology to sample the motivations of employees to share knowledge in electronic knowledge repositories (EKRs) in 17 public sector organisations in Singapore. The study, with a response rate of 37.5%, found that knowledge contributors to EKRs were motivated by the organisational rewards which were offered by all the organisations and suggested that knowledge-sharing behaviour was linked to whether the employees shared the same interests as the organisation. The KM initiatives employed by the participating organisations used EKRs to store documents, for example case studies, project reviews and presentations, with contributions via Web 2.0 not a possibility. The respondents were also active contributors to the EKRs; therefore findings are not directly generalizable to settings where the investigation of non-use or contribution to virtual communities is under consideration. Lin (2007), following a survey of 172 employees (34.4% response rate) from 50 organisations in Taiwan – 67% of which were executives – found, by contrast, that expected organisational rewards did not significantly impact knowledge-sharing intention. However, the study did not specify the mode of knowledge-sharing, for example, whether through EKRs, VCoPs or CoPs, nor did it specify whether respondents were knowledge contributors or not, therefore limiting generalizability of the findings.

Studies which did examine motivation for knowledge-sharing using Web 2.0 (Liao *et al*. 2009, Paroutis & Al Saleh 2009, Vuori & Okkonen 2012) found that soft rewards such as recognition and respect were the significant influences on motivation to contribute knowledge. Paroutis & Al Saleh (2009) concluded that monetary compensation was not a motivating issue; rather the enticement to share knowledge was 'psychosocial in nature', citing social rewards such as approval, status, respect, praise and recognition. Financial reward was reported as least motivating by Vuori & Okkonen (2012) although respondents' comments showed the importance of recognition and praise from superiors as motivating the sharing of knowledge.

3.5.1.7 Trust

Trust is defined as a 'firm belief in the reliability, truth, or ability of someone or something' (Oxford English Dictionary 2013) and has been highlighted as a key determinant of participation in knowledge-sharing in VCoPs (Ridings *et al.* 2002, Ardichvili *et al.* 2003, Ye *et al.* 2006, Usoro *et al.*

2007, Ardichvili 2008, Karpinski 2008, Liao *et al.* 2009, Paroutis & Al Saleh 2009, Fang & Chiu 2010). In VCoPs, members may well be strangers to one another; therefore trust is at what Ridings *et al*. (2002) refer to as 'the generalised, collective level'.

Usoro et al. (2007) presented findings based on their study of the role of trust in VCoPs by conceptualising trust across three elements, i.e. competence, integrity and benevolence, finding trust in the perceived integrity of the community to be the most significant forecaster of knowledge-sharing behaviour. *Competence-based trust* relates to the confidence of the individual in the specific expertise of another person, while *integrity/benevolence-based trust* concerns the expectation of the trustee that others will treat him with honesty and well-meaning kindness. Ardichvili (2008) further added the role of *institution-based trust*, referring to the role of moderators who ensure the trustworthy behaviour of members through organisational structures. In an earlier study, Ardichvili (2003) identified integrity/benevolence-based trust and competence-based trust as important barriers to participation in VCoPs, citing the fear of misuse by others of information posted, for example, being challenged or personally attacked by others.

Liao *et al.* (2009) surveyed 41 virtual communities chosen from unspecified categories, drawn from MSN Groups, Yahoo! Club and Google. Aimed at understanding the intention of giving information in VCs, respondents were restricted to those who were active contributors. Both competence and benevolence/integrity-based trust were found to be significant in predicting the desire to contribute information, with the former reported as being of less consequence than the latter. The implication that ability of contributors is less important to members than the environment in which they collaborate may be attributable to the types of VCs which were sampled, and may not be the case in VCoPs where expertise in a particular subject or area is a central concern. The lack of this information in the study limits its generalizability somewhat; nonetheless, the importance of trust is highlighted in the context of a VC.

Respondents in the study by Paroutis & Al Saleh (2009) queried the veracity and quality of contributions and revealed doubt about their trust in the competence of contributors, emphasising the importance of trust as an enabler in knowledge-sharing. This was echoed in the findings of Karpinski (2008) who conducted a survey on the use of Web 2.0 tools among medical and nursing professionals. Respondents in this study expressed uncertainty regarding the quality of user-generated contributions to blogs and wikis.

Fang & Chiu (2010) linked trust in members and trust in management to altruism and conscientiousness and showed the significant effects of these constructs on knowledge-sharing

continuance intentions in an IT-oriented VCoP in Taiwan. Trust in the competency, benevolence and integrity of other contributors was also indicated as an important predictor of knowledge contribution intention in the results of the study by Ye *et al.* (2006) who sought to identify the drivers of knowledge-sharing in a VC.

By contrast, findings by Vuori & Okkonen (2012) indicated that respondents did not seem to have any issues regarding trust, though questionnaire items used in their study fairly accurately reflected the constructs of competence, benevolence and trust. This may be due to the possibility that respondents were not strangers to one another and trusted one another already, as the study concerned a case study approach in two companies in the early implementation stages of the use of social media for internal knowledge-sharing purposes. Information on the size of the companies i.e. the number of employees, is not provided and together with the fact that the study only ran for two weeks and the relative novelty of the initiative, this may impact on interpretation of this aspect of the findings. The authors recommend caution in evaluating their findings as conclusions were based on partial analysis of a larger survey.

3.5.2 Environmental Factors

Knowledge contribution in VCoPs is primarily dependent upon the voluntary motivation of individuals to spend their valuable time and effort on engaging in the process of knowledge-sharing (Wasko & Faraj 2005). This implies that at the very least, an awareness of the availability of VCoPs within the organisation should exist, that employees should have some allocated time at work to devote to the activity and have the ability to do so. Studies reviewed have revealed that the success of VCoPs has been hampered owing to barriers identified in these areas and include the following factors, which may be summarised as implementation issues: lack of awareness, lack of time and shortcomings in training provision (Wasko & Faraj 2000, Ardichvili 2008, Karpinski 2008, Gagné 2009, Paroutis & Al Saleh 2009, Kim 2012, Vuori & Okkonen 2012).

3.5.2.1 Implementation Issues

Lack of knowledge about the tools, how they could be advantageous in the workplace and how to use them were cited as some of the main barriers to employees' willingness to contribute knowledge to Web 2.0 platforms in the study by Paroutis & Al Saleh (2009). The lack of time to participate was also reported by respondents. Karpinski (2008) found that 66% of the respondents (nurses and doctors) in her study were unfamiliar with Web 2.0 resources, noting that while they had heard of some of them, they used none of them. The lack of time to use the resources was also reported as a barrier to their use. Vuori & Okkonen (2012) stated that the foremost concern of respondents regarding knowledge-sharing using social media was that it was too time-consuming and diverted employees from their 'real' work, linked to doubts about its

effectiveness. The demand on their time due to participation in an electronic CoP was also reported by respondents as strenuous in the study by Wasko & Faraj (2000). While users may appreciate using social software as an effective means of communication and mode of knowledge-sharing, struggling to understand it and to find the time to incorporate it into their work might dissuade them from using it at all (Kim 2012).

As perceived competence in the use of computers/social media tools has been identified as a barrier to employees' willingness to contribute knowledge to Web 2.0 platforms, the next section considers the technological factors affecting the participation of employees in VCoPs.

3.5.3 Technological Factors

The responsibility of management regarding training of employees to ensure the uptake and sustained use of new technology has been highlighted in past research (Rogers 1994). While Wikipedia appears to be a successful, self-sustaining resource on the Internet, management in organisations who have purposefully introduced a VCoP as part of a KM strategy need to be mindful that its use by employees depends on a careful balance between encouragement and over-involvement (McAfee 2006). The core concept of social cognitive theory, self-efficacy (Bandura 2001) – the perceived ability of an individual to perform a certain action - has been discussed earlier in the context of knowledge self-efficacy. The use of computer software and web-based applications facilitate the operation of online communities, therefore potential users need to have the appropriate skills and competence to use them. The importance of accessibility and usability as key determinants of a successful VC has been highlighted by Preece (2001), referring to the intuitiveness and ease of use of the system. The role of technology acceptance in explaining participation in online communities or VCoPs has been explored in the literature (Hsu & Lin 2008, Kim 2012, Wang *et al*. 2012) while security and confidentiality were identified also as barriers to successful participation in VCoPs (Ardichvili *et al.* 2003, Paroutis & Al Saleh 2009). These factors will be clarified further in the remainder of this chapter.

3.5.3.1 Security and Confidentiality

Both users and non-users of Web 2.0 for knowledge-sharing reported anxiety about publishing confidential material, or the possibility of breaching company policy as barriers to their contribution of knowledge in the study by Paroutis & Al Saleh (2009). Ardichvili et al (2003), in their study of motivation and barriers to knowledge-sharing in VCoPs, observed that respondents found themselves in a "security dilemma" for these reasons also, resulting in self-imposed restrictions on contributions posted. Security issues were rated as very important by respondents in the study by Holzmann & Dubnov (2011) while a view that the company security policy was disproportionate thereby inhibiting knowledge-sharing was expressed by respondents in Vuori &

Okkonen's (2012) study of knowledge-sharing motivational factors of using an intra-organisational social media platform. Security and confidentiality issues are undoubtedly important in any knowledge-sharing environment, but the sensitive nature of the healthcare context may pose particular challenges for potential knowledge contributors in VCoPs in this area, possibly helping to explain the current situation of their under-utilisation on HSELanD.

3.5.3.2 Perceived Competence – Internet

Wang *et al.* (2012) define Internet self-efficacy as an individual's perception that they are able to use the Internet and the web-based tools required for participation in a VC. In a study of online community participation, Wang *et al*. (2012) combined the TAM with three exogenous variables: Internet self-efficacy, community environment and intrinsic motivation. Internet self-efficacy was found to positively predict PEOU, with intrinsic motivation reported as a vital addition to the TAM, being shown to positively predict PEOU, PU and actual use.

A study which was set in the context of e-learning continuance was performed by Roca & Gagné (2008) and combined SDT and the TAM as a basis for their model and its constructs. The concept of competence as described in SDT was depicted as similar to self-efficacy. PEOU was most significantly affected by Internet/computer self-efficacy, demonstrating the importance of competence in explaining motivation to perform a task and in line with SDT.

3.5.3.3 Accessibility, Usability and Perceived Ease of Use (PEOU)

Holzmann & Dubnov (2011) examined participation in entertainment oriented virtual communities in a university setting where the respondents were the students who had been involved in developing the communities as part of a course. "Ease of connecting to the website" denoting accessibility, was identified as being the most important technological aspect, while "quickness of understanding where to find relevant information", indicating the importance of usability and ease of navigation, was reported as the next most important item (Holzmann & Dubnov 2011, p. 78). Small sample size (n=19) and the fact that college students were sampled with almost 90% aged between 18 and 35 years were acknowledged as limitations of the study and therefore as factors affecting generalization to other settings. Furthermore, a study of VCs devoted to entertainment may not generate results generalizable to other types of VCs. Notwithstanding these weaknesses, these findings are in line with the views of Preece (2001), who emphasised the importance of accessibility and usability as key determinants of a successful VC.

Perceived ease of use (PEOU) relates to "the degree to which a person believes that using a particular system would be free of effort" (Davis, 1989, p. 320), with the ease of using an

application influencing the likelihood of its acceptance by users. PEOU was found to be the strongest predictor of health information technology (HIT) use in a study which examined its acceptance in health professionals (Ketikidis *et al*. 2012). Cluster sampling was used to determine the sample, drawn randomly from three city clinics, with doctors and nurses equally represented. The study, which used a structured questionnaire, yielded a response rate of 84.5% (n=169), of which 133 responses were further analysed due to only partial completion of the remainder. The results suggest that health professionals were more concerned with the skills needed to use HIT than its usefulness in their work. Although not performed in a health environment, a study of blog usage by Hsu & Lin (2008) had similar results, finding PEOU and enjoyment to be significant predictors of blog use, while PU had no effect. The authors note the importance of an easy-to-use interface involving minimum effort to learn and use in order to induce potential users. PEOU with regard to social software was shown to have a positive effect on an employee's intention to use it in a study of government employees in Korea (Kim 2012) while system usability was found to be an important predictor of knowledge contribution intention in VCs by Ye et al. (2006).

Respondents in Vuori & Okkonen's (2012) study reported that perceptions of too much effort being involved in sharing knowledge through a social media platform presented the main barrier to their participation in the practice. The complexity of the blogging activity was noted by Papadopoulos *et al.* (2012) to be linked to non-use by employees in a study which explored the determinants of knowledge-sharing via employee weblogs. Gannon-Leary & Fontainha (2007) assert that the technologies which are used and their usability represent the first critical success factor for a VCoP. They also note that technology itself may contribute to the misinterpretation of messages, owing to the lack of face-to-face communication.

3.5.3.4 Perceived Usefulness (PU)

In the context of technology acceptance, Davis (1989, p. 320) defined perceived usefulness (PU) as "the degree to which a person believes that using a particular system would enhance his or her job performance". The user believes that using the system can be advantageous with positive outcomes. The belief that sharing knowledge through a social media platform was part of their job and made their work easier was reported as a substantial motivation to do so by employees in the study by Vuori & Okkonen (2012). Current users of Web 2.0 technologies for knowledge-sharing stated they used the platforms provided because it helped them to do their jobs more efficiently (Paroutis & Al Saleh 2009). PU with regard to social software was shown to have a positive effect on an employee's intention to use it in a study of government employees in Korea (Kim 2012). An exploration of the factors which influence knowledge-sharing behaviour on blogs showed the positive effect of PU on the knowledge-sharing behaviour of VC members in a study

set in Taiwan (Yu *et al.* 2010). Of note, relating to generalizability of the findings in this study, all the respondents were users of blogs, therefore possibly possessing different characteristics to non-users of blogs. Roca & Gagné's (2008) study, which was set in the context of e-learning continuance and combined SDT and the TAM as a basis for their model and its constructs, found that PU positively affected the behavioural intention to use the system, resulting in the realisation of positive outcomes. Similar findings were reported by Wang *et al.* (2012), who found that PU prevailed over PEOU in explaining actual participation among online community participants in a TAM-based study which used a sample drawn from across the USA. The types of online communities were not specified, but the study highlighted the role of intrinsic motivation as the primary predictor of PU, PEOU and actual use and recommended that it be included in TAM-based studies in the future (Wang *et al.* 2012).

Lau (2011) reported on the perceptions of hospital-based nurses regarding knowledge-sharing and collaboration using Web 2.0 tools in a study which was based in Hong Kong in China. The usefulness of the tools, perceived advantages of using them and the availability of the technology were the main concerns of the potential users, with the attitudes of colleagues and of senior management also shown to be an influencing factor. The supportive role of management in promoting the usefulness and advantages of Web 2.0 tools for knowledge-sharing and collaboration, ensuring that the technology is available to employees and the provision of training is stressed by the author, and is noteworthy in the context of the discussion on HSELanD.

Set in Ireland, Al-iady (2011) used the TAM to examine the degree of acceptance among staff members and their readiness to use a renal patient record system which had been introduced in the dialysis units where they worked. The usefulness of the system for their work and the ease of using it was reported by staff in the study, which also proposed a technology acceptance model for future use. This study also emphasised the importance of training for employees prior to the introduction of the system into the workplace.

However, Karpinski (2008) reported that one of the main reasons identified by the doctors and nurses she surveyed for their non-use of Web 2.0 resources was that they had no perceived need for the resource, implying that they did not see it as useful. This is also of particular significance, as it concerns the views of healthcare professionals.

3.6 Conclusion

This chapter focussed on the findings from reviewed literature which offers an insight into the factors which can influence potential users of VCoPs to join and contribute in these settings. The factors were identified and clarified further where they related to the theories of motivation and

technology acceptance, which were also described in some detail. Informed by the results of the literature review, the next chapter presents the research design chosen to answer the questions this study proposes to address, namely to discover the motivating factors and barriers affecting knowledge-sharing in VCoPs on the HSELanD portal.

Chapter 4 Research Design and Methodology

4.1 Introduction

The design and undertaking of a research project implies the consideration the researcher has given to how and what they hope to learn as a result of their efforts (Creswell 2003). This means that a set of philosophical assumptions has been selected which are most appropriate given the nature of the research proposed. The strategy of inquiry to be used and the methods employed to collect and analyse data are identified and collectively inform the approach to be taken, which may be quantitative, qualitative or a mixed methods approach (Creswell 2003). This chapter begins with a short explanation of the research philosophy underpinning the approach taken in this study. The methodology follows with a section detailing the development and construction of the questionnaire used as a data collection tool and leads on to the description of population and rationale used in sample selection and recruitment. Data collection and analysis methods comprise the subject of the next section while the final part of the chapter deals with the process of ethical approval and ethical considerations pertaining to this study.

4.2 Research Philosophy and Approach

The philosophical assumptions underpinning this study reflect the influence of *positivism*, related to the quantitative approach, which claims that knowledge is derived from scientific methods of inquiry, as opposed to interpretations based on supernatural beliefs and conjecture. This view led to a belief by sociologists in the mid-18th century that the methods used in physics and chemistry research could be applied in the study of human behaviour (Parahoo 1997). *Empiricism,* the most important characteristic of positivism, is defined by Parahoo (1997, p. 40) as the theory that "only what can be observed by the human senses can be called facts", that all knowledge is based on experience derived from the senses (Oxford English Dictionary, 2013). Positivists believe in *determinism,* in which causes probably determine effects or outcomes, to explain empirical data. Researchers have managed to empirically study such concepts as attitude, patient satisfaction and pain by the use of instruments such as scales, which facilitate the observation by the researcher (Parahoo 1997). These numeric measures of observations reflect another important feature of positivism - *reductionism* – where complex phenomena are reduced to simple units enabling measurement, observation or recording (Parahoo 1997). The recognition that it is impossible to be "positive" about knowledge when the behaviour and attitude of humans are under scrutiny is referred to as "postpositivism" – the thinking after positivism (Creswell 2003). Parahoo (1997) affirms that empirical investigations are superficial analyses of behaviour and that

to enable an understanding, it is necessary to investigate the intentions and motivations of the individual.

Creswell (2003) advocates that researchers consider three criteria in deciding which approach to take in designing their research study: the research problem, the researcher's experience and the intended audience for the finished report. This study seeks to identify the factors which influence an outcome, namely participation in knowledge-sharing on HSELanD, therefore a quantitative approach was appropriate. The strategy of inquiry chosen - a cross-sectional survey - reflects the intention of being able to generalise findings from a sample to a population, which is a possible outcome of the study. The systematic rules and procedures required in quantitative research appealed personally to the researcher, and matched time and cost-related resources, while the intended audience of academic supervisors approved of this choice.

Drawing on the positivist paradigm, a quantitative approach has been employed in this study and uses what Parahoo (1997, p. 51) refers to as a "modified form of empiricism", being dependent on the subjective ratings of respondents. Qualitative approaches – from the *interpretivist* paradigm - share the principle that the context in which human behaviour occurs and the meanings individuals attach to their experiences must be studied in order to understand human behaviour (Parahoo 1997). In pursuit of triangulation and in order to provide richer sources of data, a feature of qualitative approaches – *ethnography* - is reflected within the questionnaire – the method of choice, which is elaborated further upon in the next section.

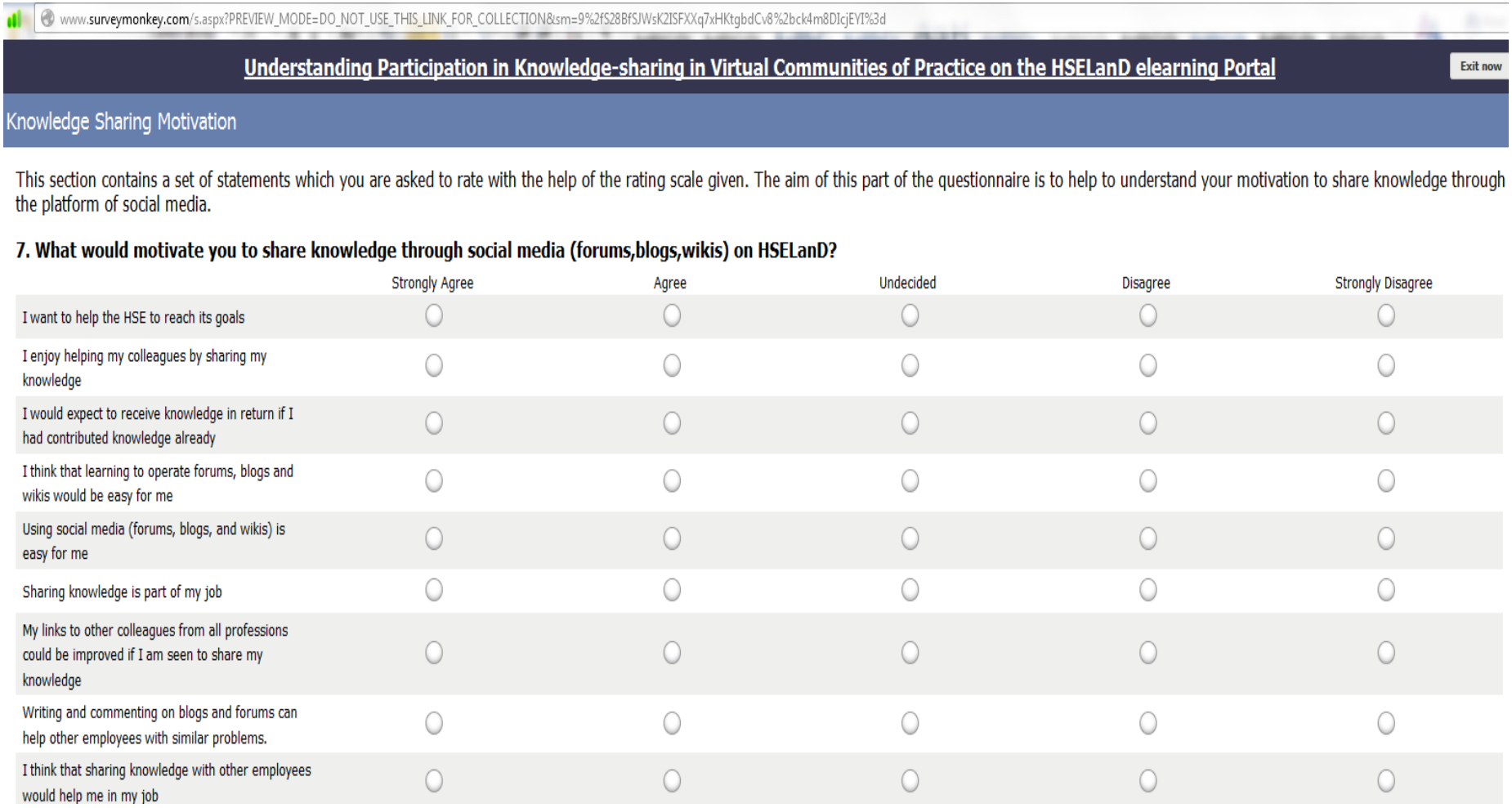
4.3 Questionnaire Design

The role of technology acceptance in explaining participation in online communities or virtual communities of practice (VCoPs) has been explored in the literature (Hsu & Lin, 2008, Kim, 2012, Wang *et al*. 2012) and these authors have included such variables as 'social factors', 'intrinsic motivation' and 'internet self-efficacy' in adapted models in order to expand the predictive power of the Technology Acceptance Model (TAM). This method of theory adaptation follows the approach of Perugini & Bagozzi (2001) who sought to revise existing theory by adding new constructs or variables, thereby expanding and deepening the original theory. Caution in this interpretation is advised by Holden & Karsch (2010), who advise that only evidence-based additions to the TAM are acceptable in this regard, with the setting of the healthcare environment presenting an extra challenge to researchers. Referring to a 'contextualised version of TAM', Holden & Karsch (2010) hold that a TAM for healthcare workers should be considerate towards the particularities of the different professionals and their work environment. A 'beliefs elicitation study' is advocated to inform this contextualised version, where clinicians are asked

directly about their beliefs, for example, questions regarding the approval or disapproval of superiors concerning their use of IT, aimed at understanding social pressure. Reasons for these beliefs can be elicited, thereby enabling changes to be made with the intent of fostering IT use. This methodology is congruent with the 'added variables' approach, as beliefs elicitation can inform and endorse any additions of constructs or variables (Holden & Karsch, 2010).

Keeping in mind the "added variables" approach as outlined above, a questionnaire was developed based on the literature review of studies of participation in online communities pertaining to theories of motivation, TAM recommendations and based on validated scales from these sources. In order to make inferences about some characteristic, attitude or behaviour of a population (Babbie 1990), the online, self-completion questionnaire was employed to obtain a numerical representation of the attitudes, beliefs and motivation of a sample of employees to use Practice Development Hubs for knowledge-sharing on HSELanD **(Figure 4.1)**. A facility to add free text comments and suggestions at the end of the questionnaire provided the basis for the qualitative evaluation of these responses. This method was chosen due to low cost considerations, ease of administration, broad population coverage and the advantage that all respondents have the same questions presented to them in a standard way, thereby reducing chances of interviewer bias (Moore 2006). SurveyMonkey, which is a provider of web-based survey solutions, was selected to enable the chosen method. A paper version of the questionnaire was also developed to ensure the opportunity of participation in the study to those employees who either may not have ready access to their employer-hosted email account or may not have an account, as within the HSE, having a work email address is dependent upon the work role of the employee. **(Appendix A)**.

Figure 4.1 Screenshot of online questionnaire



www.surveymonkey.com/s.aspx?PREVIEW_MODE=DO_NOT_USE_THIS_LINK_FOR_COLLECTION&sm=9%2fS28BfSJWsK2ISFXXq7xHKtgbdCv8%2bck4m8DIcjEYI%3d

Understanding Participation in Knowledge-sharing in Virtual Communities of Practice on the HSELanD elearning Portal

Exit now

Knowledge Sharing Motivation

This section contains a set of statements which you are asked to rate with the help of the rating scale given. The aim of this part of the questionnaire is to help to understand your motivation to share knowledge through the platform of social media.

7. What would motivate you to share knowledge through social media (forums,blogs,wikis) on HSELanD?

	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
I want to help the HSE to reach its goals					
I enjoy helping my colleagues by sharing my knowledge					
I would expect to receive knowledge in return if I had contributed knowledge already					
I think that learning to operate forums, blogs and wikis would be easy for me					
Using social media (forums, blogs, and wikis) is easy for me					
Sharing knowledge is part of my job					
My links to other colleagues from all professions could be improved if I am seen to share my knowledge					
Writing and commenting on blogs and forums can help other employees with similar problems.					
I think that sharing knowledge with other employees would help me in my job					

Source taken from https://www.surveymonkey.net/MySurvey_EditorFull.aspx?sm=fPLljfDoyN1eUg%2bIpsDgb8Cvazt3s4nen2744XnGIiA%3d

In this study, items used to operationalize the variables (or constructs) as identified in the literature review were presented as statements which respondents were asked to rate using a five-point Likert scale (ranging from 5 = strongly agree to 1 = strongly disagree). Rating scales permit researchers to try to measure attitudes and motivation (Parahoo 1997), as in this study, giving an overall score as a measure, for example, how motivated the employees are to share their knowledge in VCoPs. Some of the items used were derived and adapted from a study by Lin (2007), with the majority taken from Vuori & Okkonen (2012) and modified for use as appropriate. Permission was sought and received in the case of Vuori & Okkonen, by contacting the corresponding author (Vuori) by email to request permission to use and modify their questionnaire **(Appendix B)**. As both of these studies could be assumed to have been conducted in a language other than English (although this was not stated) – set in Taiwan and Finland, respectively - amendment of some of the language used in the items was of particular importance, also a necessity in terms of context. A draft of the questionnaire was piloted among a sample of staff from various professions in the workplace being studied, and comments received regarding clarity of content, wording and relevance were acknowledged and incorporated into a revised version. The validity and reliability of the instrument is thereby increased, according to Parahoo (1997) and enhances its' usefulness in future replication studies. Validity refers to how well the research measures what it claims to measure without prejudice or misrepresentation while reliability indicates the consistency of measurement within a study, usually tested by repeating the measurement (Lacey 2006).

4.3.1 Measures

The hard copy version of the questionnaire was printed on 120g/sqm quality white paper as an A4 sized four-page booklet and was divided into five main sections:

- **Computers, the Internet and You** – asked respondents about their experience of using computers and the Internet and their familiarity with social media. These questions were intended to generate data regarding computer and Internet self-efficacy and employees' awareness and accessibility of the resource.

- **Knowledge-Sharing Motivation** – this part of the questionnaire aimed to understand the motivation of employees to share knowledge through the platform of social media. The statements which respondents were asked to rate using a rating scale were derived from factors identified from the literature review shown to be instrumental in affecting motivation to share knowledge via this method. These factors include altruism,

reciprocity, ease-of-use, reputation, knowledge-self-efficacy, usefulness, trust, recognition and rewards.

- **Barriers to Knowledge-Sharing** – respondents were asked to consider statements reflecting barriers to knowledge-sharing as identified in the literature review and to rate them from their point of view. These statements were based on the following issues related to barriers: ease-of-use, usefulness, accessibility, lack of time, non-altruism, trust, rewards, knowledge self-efficacy, computer/Internet self-efficacy and security issues.

- **Your Intention to Share Knowledge** – this section attempted to assess the intention of employees to share knowledge on HSELanD and included a section where respondents could add any free-text comments or suggestions for qualitative evaluation – reflecting the inclusion of features of the ethnography approach.

- **Demographics** – these questions were limited to provide information considered necessary for data analysis and interpretation and were situated at the end of the questionnaire (O'Regan 2011).

Yu *et al.* (2010, p. 36) positioned items in their questionnaire randomly, rather than together with all those intended to measure the same construct. This was an attempt to avoid "the potential ceiling (or floor) effect that induces monotonous responses" and was also applied to the questionnaire used in this study. **Table 4.1** shows the list of constructs and related items. Lastly, an option to provide their contact details was provided to respondents to enable their entry into a draw for a voucher of small monetary value (€50) in order to encourage participation.

List of items by construct	
Computer Self-efficacy (CSE)	
CSE1	I consider myself an experienced user of computers
CSE2	I need more training in basic computer skills
Internet Self-efficacy (ISE)	
ISE1	I am experienced in using e-mail
ISE2	I am experienced in using the Internet
ISE3	I need more training to use social media, e.g. forums, blogs, wikis
ISE4	I do not know how to use social media
Altruism (AL)	
AL1	I want to help the HSE to reach its goals
AL2	I enjoy helping my colleagues by sharing my knowledge
AL3	Writing and commenting on blogs and forums can help other employees with similar problems.
AL4	Sharing knowledge is part of my job.
AL5	I would contribute to knowledge-sharing forums on HSELanD without expecting benefits.
AL6	I am not interested in accessing HSELanD outside of work-time to share knowledge using social media.
Reciprocity (REC)	
REC1	I would expect to receive knowledge in return if I had contributed knowledge already.
REC2	I might not get enough knowledge in return.
Recognition (RECOG)	
RECOG1	My links to other colleagues from all professions could be improved if I am seen to share my knowledge
RECOG2	If my participation in knowledge-sharing on HSELanD was recognised by colleagues and superiors, I would be more motivated to share my knowledge
Knowledge self-efficacy (KSE)	
KSE1	I am confident in my ability to provide knowledge that other employees using HSELanD would consider valuable
KSE2	I feel insecure about how my knowledge might be received and understood.
KSE3	I do not think that my knowledge is important enough.
KSE4	I am not sure whether my knowledge is reliable.
KSE5	I am afraid of criticism from other employees using HSELanD social media.
KSE6	I am afraid that I reveal what I don't know people will think I am not as proficient as they had expected.
Rewards (REW)	
REW1	Using social media to share knowledge on HSELanD could make my employment more secure.
REW2	I want to receive financial reward in return for my knowledge sharing.
REW3	Using social media to share knowledge on HSELanD could lead to opportunities for promotion.
REW4	I would not be adequately rewarded for sharing my knowledge on HSELanD.
Trust (TR)	
TR1	I would trust the information and knowledge provided by other employees using social media on HSELanD.
TR2	I am afraid that other employees might claim my ideas as their own.
TR3	I do not believe that I can get good quality knowledge from the social media sources on HSELanD.
TR4	I do not want to share my knowledge with people I do not know well.
TR5	I am afraid of losing ownership of the knowledge.
Self-esteem (SE)	
SE1	I want to achieve my own goals.
SE2	I want to show off my experience.
Accessibility (ACC)	
ACC1	I don't always have access to a computer at work when I need it.
Time (TI)	
TI1	I have no time at work to access HSELanD.
Security (SEC)	
SEC1	I am concerned about breaking Data Protection laws if I use social media on HSELanD to discuss work topics.
Intention to use (INT)	
INT1	I intend to share my knowledge through social media with other employees on HSELanD.
INT2	I will try to share my knowledge through social media with other employees on HSELanD.
Perceived usefulness (PU)	
PU1	I think that sharing knowledge with other employees is beneficial in healthcare.
PU2	Knowledge-sharing with other employees in the HSE is valuable.
PU3	I think that sharing knowledge with other employees would help me in my job.
PU4	I find computers useful in my job.
PU5	I believe that computers in health care will create more work for employees.
PU5	It is just another information system.
PU6	I do not think that employees using social media is useful in the healthcare environment.
Perceived ease-of-use (PEOU)	
PEOU1	I think that learning to operate forums, blogs, and wikis would be easy for me.
PEOU2	Using social media (forums, blogs, and wikis) is easy for me.
PEOU3	It takes too much time and effort.
PEOU4	HSELanD is not user-friendly.
PEOU5	I find it difficult to find what I'm searching for on the HSELanD portal.

Table 4.1 List of constructs and related items

4.4 Population and Sample Selection

An invitation to participate in the study was sent via internal email and by the use of a poster advertising the study requesting employees to take part **(Appendices C and D)**. These employees, over 1,400 at the study site, are from all clinical disciplines and include those from allied health professions. Some HSE employees, depending on their role within the organisation, have an allocated email address with an account maintained by the employer. The study population was accessed by sending these employees an invitation via internal email to take part in the research with a link to the questionnaire on SurveyMonkey to enable them to do so. Those employees without this facility were equally invited to participate by the poster advertising the study. Paper versions of the questionnaire were distributed to individual work areas to enable participation for those employees who did not have a work email address and were collected by the researcher on a specified date. It was intended to recruit as many participants as possible from across all areas where employees have access to and use HSELand learning facilities, keeping in mind that access to the portal itself is possible from any location over the Internet, at home or at work and irrespective of whether or not HSE employees have a work email address. Ideally, the majority of staff representing all grades and areas of specialty would respond, but it was acknowledged that if a representative sample of close to 30% responded, it would be satisfactory. This study used a non-probability, convenience sample which enabled direct sampling of those respondents who chose to respond to the invitation to participate. Data and information generated by this study reflect the responses of participants who are employed at Sligo Regional Hospital. The choice of Sligo hospital employees is a convenience sample, and being an example of a regional hospital, is logical in the context of this study and serves as a pilot for a potential larger-scale national study in the future.

4.4.1 Inclusion/Exclusion Criteria

Research participants had to be aged at least 18, be employees of the HSE, with permanent/temporary contract status irrelevant, from any grade, or work environment within Sligo Regional Hospital, from the following disciplines: (based on user activity on HSELanD)

*User activity across disciplines

1. Nursing	65%
2. Clerical/Administration	19%
3 Health and Social Care Professionals	10%
4. Support Services	3%
5. Medical/Dental	3%

*Personal Communication: (March 2012) Email from the General Manager, HSE National Human Resources Directorate to Sandra Gormley.

Respondents who were under 18 years of age, or not working within Sligo Regional Hospital, or were non-employees, from any discipline were excluded from the study.

4.5 Data Collection and Analysis

4.5.1 Data collection

The process of data collection took place in December 2012, over a period of three weeks. The email inviting participation in the study with a link to SurveyMonkey was sent to 600 employees with active work email accounts. 330 questionnaires were distributed in person to 33 departments within the hospital complex **(Appendix E)** and a brief meeting was held in each area between the researcher and the manager in order to explain the purpose of the research and to agree a suitable and safe location in which to place the questionnaires. 2 large sturdy envelopes were provided in each area; one envelope contained the questionnaires and attached participant information sheet, the other the completed questionnaires – both appropriately labelled. Completed questionnaires were kept separately to facilitate confidentiality. The aforementioned poster to advertise the study and encourage participation was positioned in an appropriate location. A time and date was agreed in each area for interim collection of questionnaires at intervals over the 3 weeks, at which time the managers were reminded of the option for employees to take part in the research. Follow-up emails were sent after one week and two weeks to remind employees that the study would value their response and of the option to participate in the draw for the voucher of monetary value **(Appendix F).**

4.5.2 Data analysis

The data collected from the hard copy questionnaires were entered manually onto the SurveyMonkey survey software and combined with that recorded from participants who had completed the online questionnaire to facilitate evaluation. This was then transferred to a spreadsheet to enable statistical analysis to examine the motivations of employees and barriers to their participation in knowledge-sharing in VCoPs on HSELanD. Analysis of the data was guided by principles of motivational theory and by the recommendations of the TAM, investigating

individual motivational factors, employee level of awareness of the availability of the resources, and the functionality provided. The influence of users' perceptions of the relevance, usefulness and ease-of-use of the technology was examined in light of their intentions to use it. Themes emerging from the evaluation of the free-text comments and suggestions provided by respondents were categorised and considered in the summary evaluation of the results.

4.6 Ethical Considerations

Ethical approval for this study was received from the Research Ethics Committee at the study site and from the School of Computer Science and Statistics Research Ethics Committee, Trinity College, Dublin **(Appendices G and H).** Research participants are entitled to know why they have been selected, to information about the study, why it is being conducted and what will happen to the data (Murphy-Black 2006). These issues, as well as privacy and confidentiality assurances, the right to refuse to take part and data protection concerns were all addressed in the participant information sheet which accompanied each paper questionnaire and was incorporated into the start of the online version **(Appendix I)**, thereby providing all information necessary for informed consent. Voluntary participation and the choice that participants may withdraw at any time without penalty was emphasised in this document, however, it is acknowledged that due to the anonymity of the respondents, it was impossible for a research participant to withdraw from the study once the questionnaire had been submitted. Proceeding to complete the self-administered questionnaire (online or paper) provided implied consent and the data collected and processed were irrevocably anonymised. Invitees receiving the paper-based version of the questionnaire had the opportunity to reflect on the information provided and their decision to participate, while those accessing the on-line questionnaire had the choice to proceed by clicking a link to do so. However, these potential respondents, although they may have already proceeded to the on-line questionnaire, could opt out of completing it without penalty at any time. Due to the nature of the planned study, the risk of any harm to participants was not expected and no specific consent issues were anticipated as there is no dependent relationship between the researcher and any potential participants in the study. Participants were invited to make contact in the event of any question or concern. If any participant had demonstrated distress to the researcher, they would have been advised to attend a professional counsellor whose contact details would be provided.

Data collected in hard copy format were kept in a separate locked filing cabinet in the secure office of the researcher, while data collected via the online tool were saved on to CD ROM and stored in the same location. Access to computer files concerning the data was password protected and available to the researcher only. In order to uphold the participants' right to confidentiality, all information provided was, and is, kept fully confidential. This study did not

require access to participants' personnel records. Data were collated and analysed and individuals are not identifiable in the results. The researcher was unaware of the identity of participants and responses did not require any form of personal identification. Respondents optionally providing contact details had their data irrevocably anonymised. Therefore, participant contact details for the purposes of entry to the draw were not stored in association with the questionnaire responses once submitted. Finally, participants were informed that they could access results of the study from the researcher on request. Although there were no direct benefits predicted for research participants, they had the option of entering the draw for a voucher of monetary value (€50).

This chapter began with a short explanation of the research philosophy underpinning the approach taken in this study. The development and construction of the questionnaire used as a data collection tool followed and led on to the description of population and the rationale used in sample selection and recruitment. Data collection and analysis methods was the subject of the next section while the final part of the chapter dealt with the process of ethical approval and ethical considerations pertaining to this study. We now turn our attention to the results of the research and discussion of the findings in the following chapter.

Chapter 5 Results and Discussion

5.1 Introduction

Data collected for the purpose of answering the research questions, known as raw or crude data, (Parahoo 1997) requires further work before any answers or sense can be made of them. This work is the process of data analysis and is necessary so that researchers can turn the results of their study into a format which others can understand. The use of a survey in the research design implies the consideration given in this study to the details of how data analysis should proceed, as surveys are suitable methods of enquiry for studies comprising descriptive and correlational elements (Parahoo 1997), such as this one. According to Parahoo (1997), the descriptive level of the inductive process in quantitative research involves the description of phenomena, while the correlational level seeks to examine the connections between variables; therefore the process of data analysis in this study followed the procedures of descriptive statistics.

This chapter presents and discusses the results acquired from the analysis of the survey data. At the outset, the response rate particulars and a description of the socio-demographic details of the study participants are presented. Analysis of descriptive statistics comprises the next section, which seeks to discover the extent of the motivating factors and barriers affecting knowledge-sharing among employees in VCoPs on the HSELanD portal. Themes emerging from the evaluation of the free-text comments and suggestions provided by respondents are then categorised and considered in the context of the results of analysis of the statistical data. The last section discusses the results, comparing and considering them in the light of previous research findings in this area.

5.2 Response rate

Acknowledging the difficulties of defining an acceptable response rate, Parahoo (1997) notes the influence of study design and method of data collection. The online questionnaire was available for three weeks but in reality, only those who accessed their email account and read the invitation to participate had the chance to do so. It was also not possible to know how many invitations were accessed without resulting in proceeding to take part. Anticipating this, and to ensure equal opportunity to take part, the poster advertising the study was distributed with hard copies of the questionnaire to 33 hospital departments. Both strategies yielded a total of 181 responses, 41 from the Internet-based source and 140 hard copy questionnaires. Simply calculated as a percentage of the study population (n = 1482), the response rate was 12.2%, lower than what had been anticipated.

5.3 Socio-demographics

The socio-demographic details of the study respondents are outlined in the following subsections and provide a useful context in which to understand the statistical findings presented subsequently. **Table 5.1** displays an overview of the demographic profiles.

Profile of Respondents	Total No. of Respondents	n=181	
Demographics	**Details**	**Frequency**	**Percentage**
Age Profile of Respondents	18-30	19	11%
	31-40	66	37%
	41-50	71	40%
	51-60	19	11%
	60+	1	1%
Gender	Male	17	10%
	Female	151	83%
	Undisclosed	13	7%
Highest Level of Education	Secondary School	4	2%
	Certificate	17	10%
	Diploma	23	13%
	Bachelors Degree	86	49%
	Masters Degree	32	18%
	Doctoral Degree	2	1%
	Other	12	7%
Profession/Current Job Title	Clerical	10	6%
	Medical/Dental	5	3%
	Support Staff	9	5%
	Nursing	106	63%
	Allied Health Professionals	37	23%
Level of Seniority	Director	1	1%
	Senior Manager	8	5%
	Line Manager	20	12%
	Staff	123	71%
	Other	22	11%

Table 5.1 Demographic profiles of respondents

5.3.1 Age

Five categories of age range options were presented to respondents: 18-30 years, 31-40 years, 41-50 years, 51-60 years and above 60 years. The majority were between the ages of 31 and 50 (77%), suggesting that most of the respondents were experienced in their professional roles **(Figure 5.1, Table 5.2)**. It cannot be definitively assumed, however, that this reflects experience in their respective fields, as information regarding tenure of service was not requested.

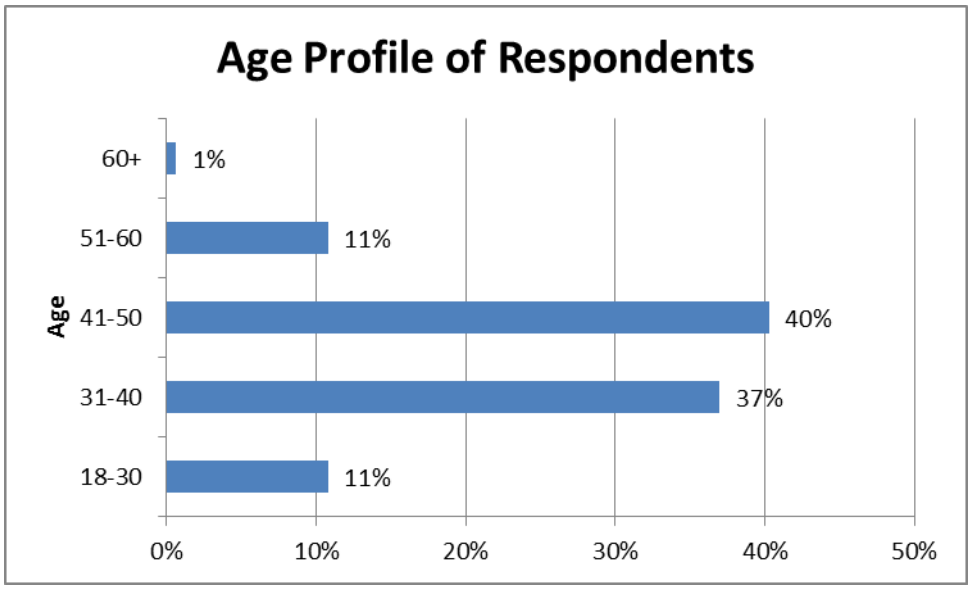


Figure 5.1 Age profile of respondents

Which category below includes your age?		
Answer Options	Response Percent	Response Count
18-30	11%	19
31-40	37%	66
41-50	40%	71
51-60	11%	19
60+	1%	1
answered question		176
skipped question		5

Table 5.2 Age distribution of respondents

5.3.2 Gender

Respondents were predominantly female, comprising 83% of the sample (n=151), even when allowing for the 13 respondents who did not reveal their gender. This could be attributable to the study setting being in a hospital environment, where the majority of health care workers are traditionally female.

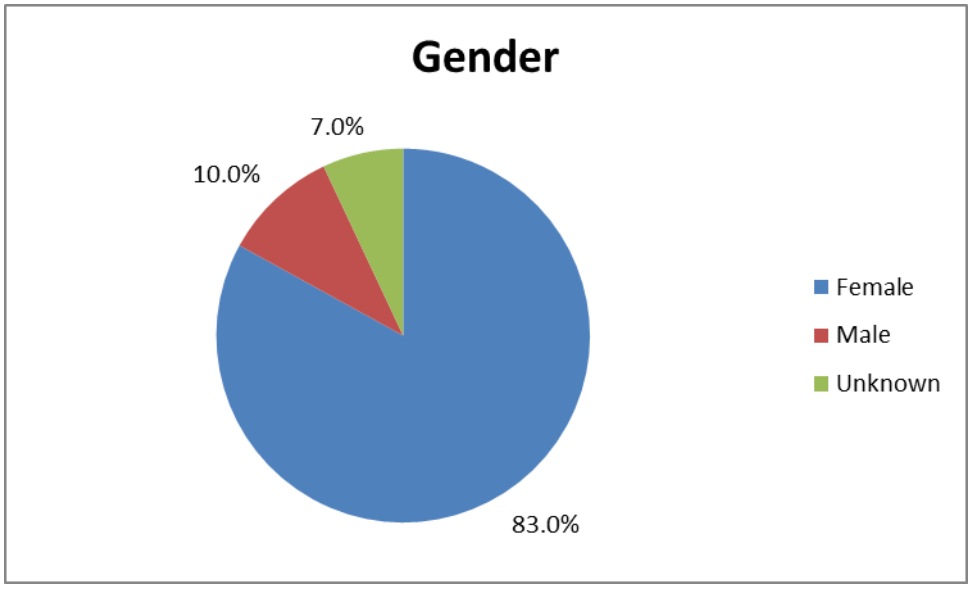


Figure 5.2 Gender distribution of sample

Gender:		
Answer Options	Response Percent	Response Count
Female	83.0%	151
Male	10.0%	17
Unknown	7.0%	13
answered question		168
skipped question		13

Table 5.3 Gender distribution of sample

5.3.3 Level of education

Five respondents did not answer the question regarding education, but of the remaining 176, 75% were graduates (n=132). This reflects the addition of respondents in the 'other' category, who all detailed various postgraduate qualifications. One quarter of the graduates (n=32) had pursued Masters Degrees, with 2 respondents having doctorates. These results reflect a well-educated sample of respondents, with all but 2% (n=4) having completed post-secondary school education at various levels.

What is the highest level of education you have completed?		
Answer Options	**Response Percent**	**Response Count**
Secondary school	2%	4
Certificate	10%	17
Diploma	13%	23
Bachelors Degree	49%	86
Masters Degree	18%	32
Doctoral Degree	1%	2
Other (please specify)	7%	12
	answered question	176
	skipped question	5

Table 5.4 Level of education of sample

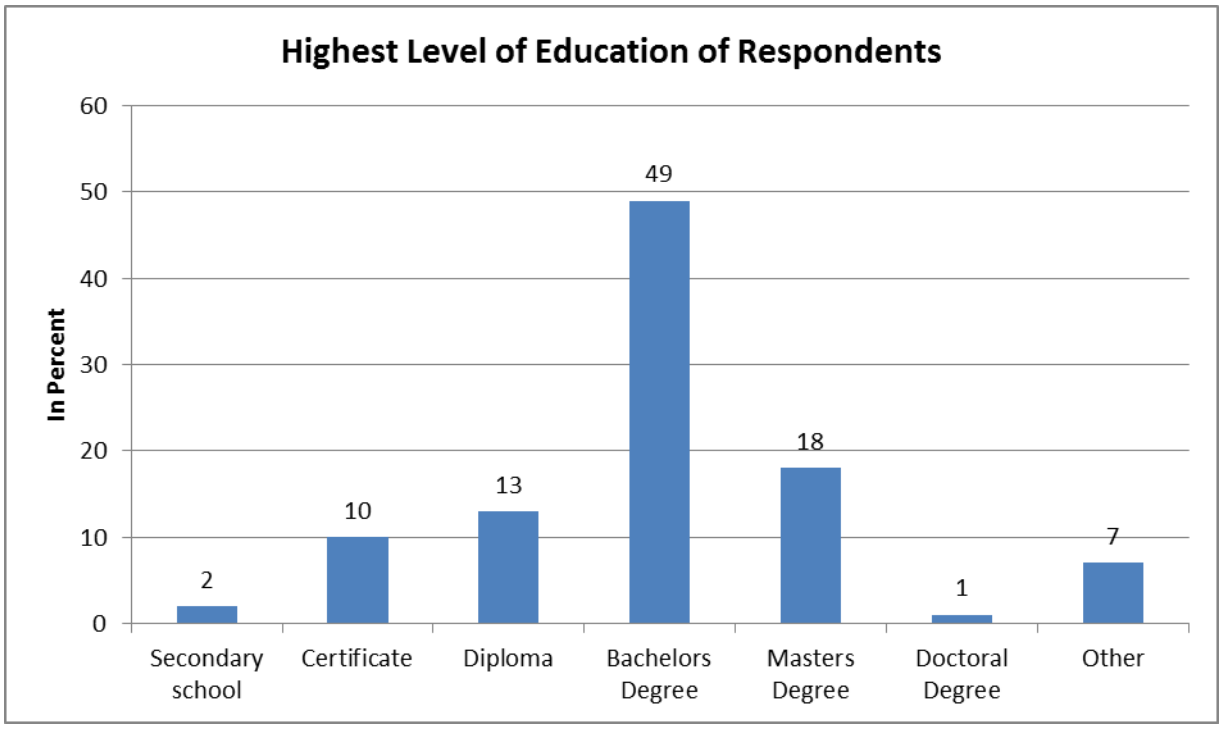


Figure 5.3 Level of education of sample

5.3.4 Profession and Job Title

While the study hoped to achieve a representative cross-section of employees as respondents, the majority were from the nursing profession (n=106, 63%). Thus nurses were over-represented in the sample, based on the most recently available 'Headcount report' for Sligo Regional Hospital (2012)**(Appendix J),** which shows that the nursing discipline accounts for 41.4% (n= 613) of all employees. **Figure 5.4** and **Table 5.5** illustrate a breakdown of the job titles/professions of respondents and shows clearly that Allied Health Professionals (physiotherapists, occupational therapists, dieticians, radiology, laboratory, cardiac investigations and pharmacy staff) were the next most represented group of respondents (n=37, 23%) in the sample. This group was also over-represented when compared with the actual percentage of total employees working in these disciplines in SRH (n=156, 10.5%). Clerical, support staff and medical/dental employees comprised the remainder of the sample, making up 6%, 5% and 3% of the total respondents, all under-represented according to the headcount report (SRH 2012). 14 respondents left this question unanswered. Nevertheless, all employee groups having access to HSELanD were represented in the sample.

What is your profession/current job title?		
Answer Options	Response Percentage	Response Count
Clerical	6%	10
Medical/Dental	3%	5
Support Staff	5%	9
Nursing	63%	106
Allied Health Professionals	23%	37
		167
answered question		167
skipped question		14

Table 5.5 Profession/current job title of respondents

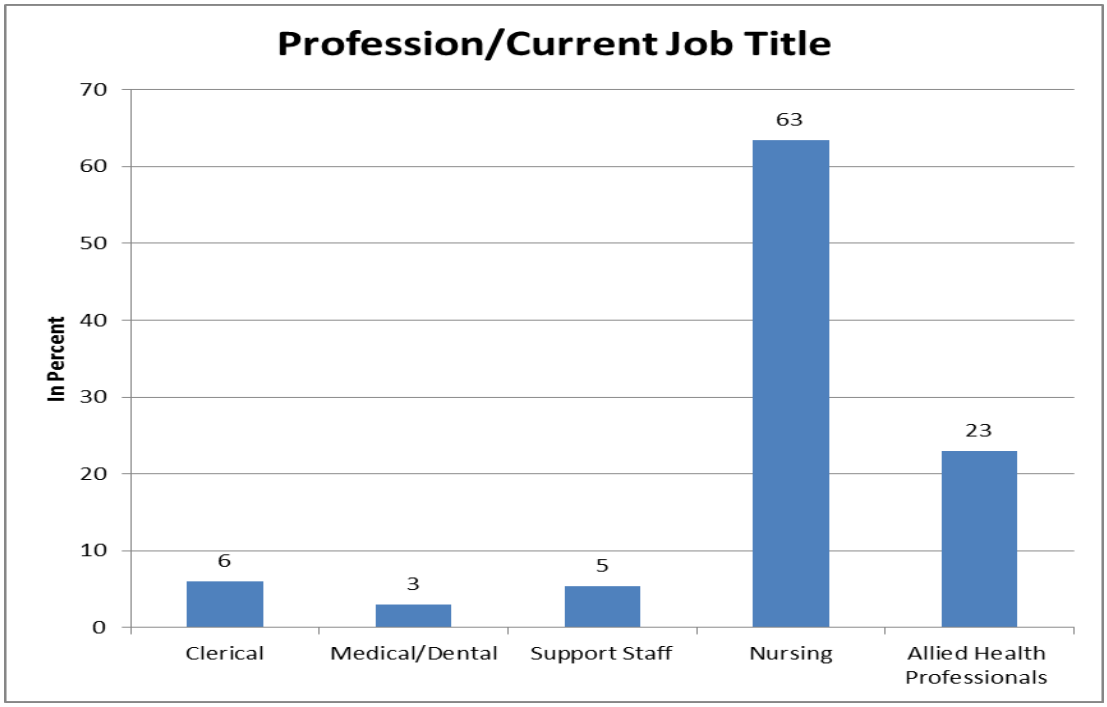


Figure 5.4 Profession/current job title of respondents

5.3.5 Level of seniority at work

7 respondents did not answer this question, but of the 174 who did, 71% (n=123) described themselves as staff as opposed to the other choices of levels of management offered on the questionnaire. Examination of the replies of those who specified 'other' showed that these respondents were also staff rather than in supervisory/management positions, therefore this group (11%, n=22) when added to the 'staff' group show that a total of 82% of respondents were not in management roles at work. The remainder held managerial positions as depicted in **Figure 5.5** and **Table 5.6**.

Which of the following best describes your position at work?		
Answer Options	**Response Percent**	**Response Count**
Director	1%	1
Senior Manager	5%	8
Line Manager	12%	20
Staff	71%	123
Other (please specify)	11%	22
	answered question	174
	skipped question	7

Table 5.6 Respondents level of seniority at work

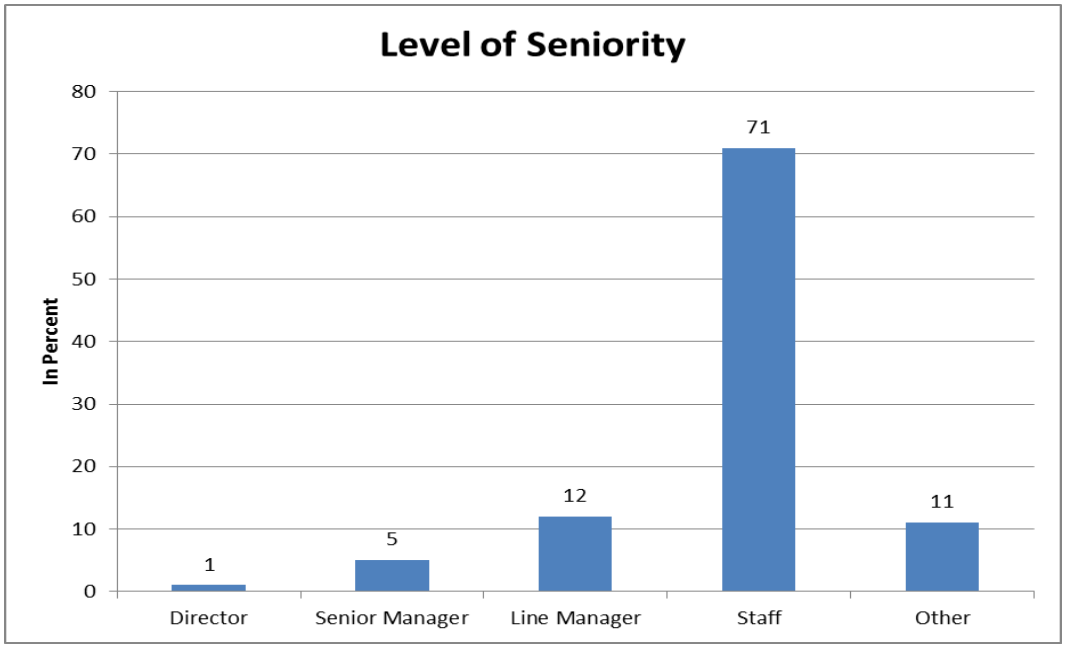


Figure 5.5 Respondents level of seniority at work

5.3.6 Computer and Internet self-efficacy

Respondents were asked in the first section of the questionnaire about their experience in computer and Internet use and their responses are illustrated in **Figure 5.6.**

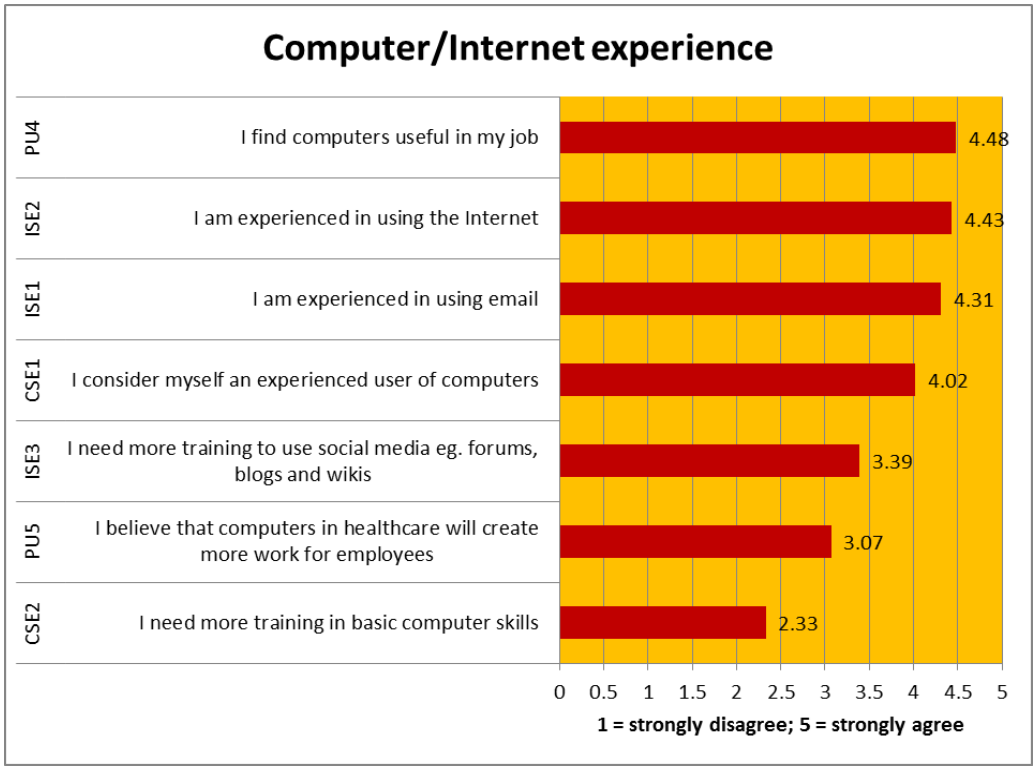


Figure 5.6 Computer/Internet experience of sample

All respondents answered this question and it can be seen that computer use for the sample members, including the use of the Internet and email was not a problem, with rating averages between 4.02 and 4.43. However, employees agreed that training in the use of social media was a necessity, with a rating average of 3.39. This is significant, because if employees perceive themselves as unable to use the technology offered to enable knowledge-sharing on HSELanD, they are unlikely to attempt to try to use it.

5.4 Knowledge-sharing motivational factors

The second section within the questionnaire aimed to understand the motivation of employees to share knowledge through the platform of social media. The statements which respondents were asked to rate were derived from factors identified from the literature review shown to be instrumental in affecting motivation to share knowledge via this method. Each statement relates to a construct (or variable) as depicted in Table 4.1 (in the previous chapter). **Figure 5.7** illustrates the statements with the calculated rating average by respondents depicting their level of agreement with the statements. Only 3 respondents did not answer this question.

The results reveal that respondents would be motivated to share knowledge through social media on HSELand, strongly agreeing that it is part of their job and demonstrating their expectation of reciprocal benefit in the form of receiving knowledge in return. The importance of recognising the altruistic qualities of employees is highlighted by the foremost positions of 3 statements reflecting this construct as highly motivating for respondents, showing the influence of intrinsic motivation (rating average range from 4.01 to 4.41 – agree/strongly agree). The respondents strongly agreed on the value of knowledge-sharing as beneficial to themselves and to colleagues, showing the significant relevance of perceived usefulness. This construct was represented 3 times within the top 6 statements measuring aspects of motivation with rating averages ranging from 4.1 to 4.37. Recognition of their contributions by superiors featured highly as a motivating factor while respondents reported no reluctance to share knowledge due to any concerns about either their own knowledge self-efficacy or regarding trust in the competence of other contributors.

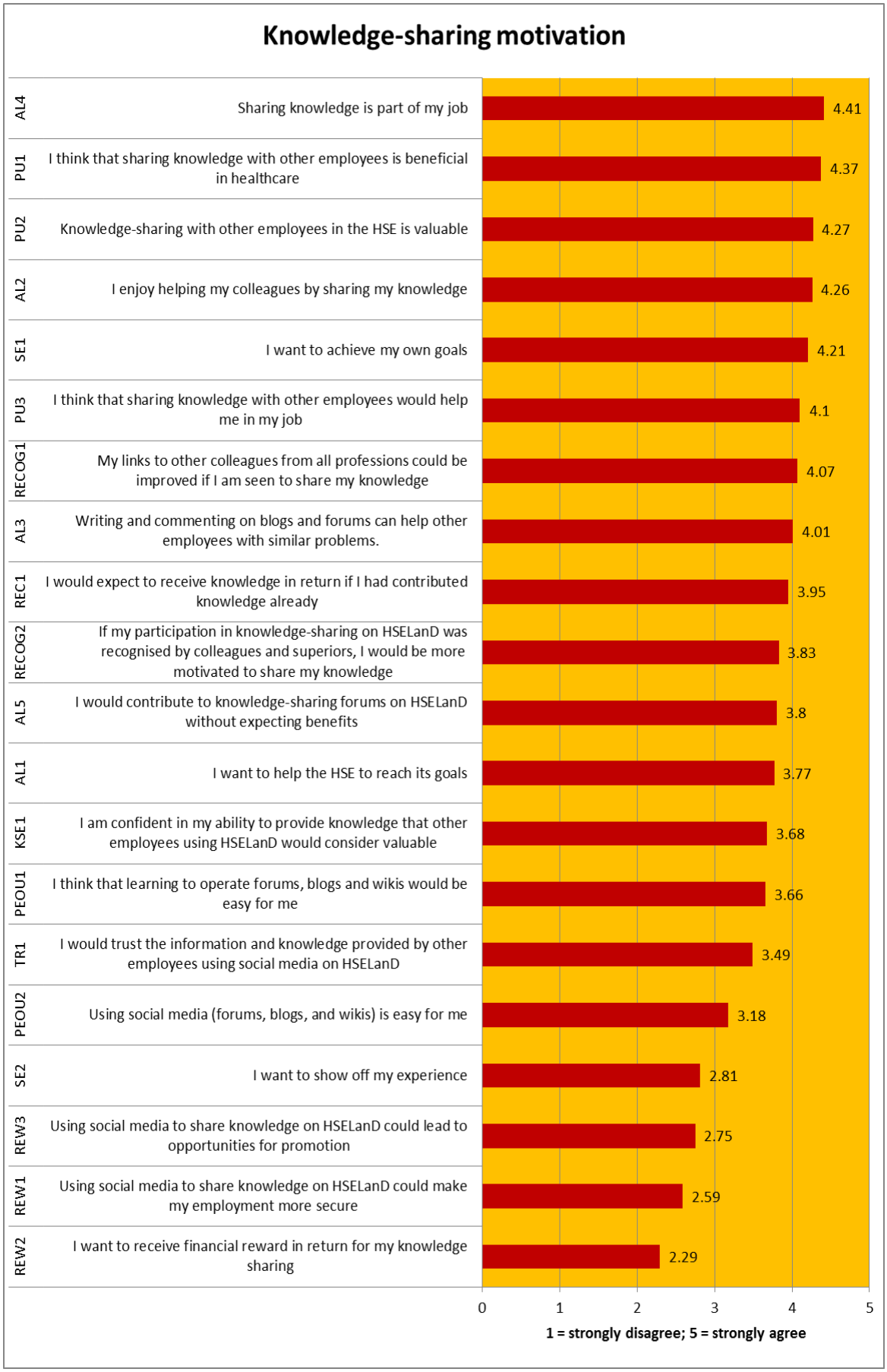


Figure 5.7 Motivation of employees to share knowledge through social media on HSELanD

Respondents did not seem to regard social media use as difficult for them to learn or use, with a rating average of between 3.18 and 3.66 for these statements. External rewards in the form of opportunities for promotion, financial rewards or chances to show off were reported as the least motivating factors.

Overall, the responses paint a positive picture of employees' motivation to share their knowledge through the facilities provided on HSELanD, with the lowest mean reading at 2.29.

5.5 Barriers to knowledge sharing

The third section of statements examined the perceptions of employees regarding barriers which would prevent them from sharing their knowledge using social media on HSELanD and asked respondents to rate them on a scale of 1 (strongly disagree) to 5 (strongly agree) according to their point of view. Again, these statements reflected factors identified in the literature review as issues related to barriers to knowledge-sharing in various settings. **Figure 5.8** provides an illustration of the results. All but 6 of the respondents answered this question.

The most significant barriers to knowledge sharing perceived by employees was their lack of time at work to access HSELanD, that too much time and effort was involved and that using the portal for knowledge-sharing was something they saw should happen during work time anyway rather than during their free time. The fourth most influential barrier identified by respondents seemed to indicate indifference – 'it is just another information system'- which raises questions about how relevant or useful HSELanD and the facilities to share knowledge are in the opinion of employees. Perceived ease of use featured 3 times out of the top 8 barriers with respondents seeming to find HSELanD to be user-unfriendly and difficult to navigate, assuming they had access at work to a computer, which was the fifth most important barrier.

Concerns about security and data protection were also issues of increased importance to respondents, with a rating average of 3.12, perhaps understandable in the sensitive clinical environment. The inability of employees to use social media was highlighted as a significant barrier in this section of the questionnaire and was further evidenced in answers to questions in the first section regarding experience in computer, Internet and social media use. Although using the Internet and email was not a problem for respondents, they agreed that there was a need for more training to use social media in particular with a rating average of 3.39, and the majority response of having no experience whatsoever in social media use is noteworthy in the answers to question 2, as shown in **Figure 5.9**.

Respondents' knowledge self-efficacy could be a barrier for some to their knowledge-sharing on HSELanD, with response rating averages for this construct ranging from 2.36 to 2.77, meaning that respondents were undecided, though tending to disagree with statements reflecting any lack of their competency to provide reliable, valuable knowledge to other employees. The study participants tended to agree that lack of reciprocity, such as not receiving knowledge in return for contributions was considered a barrier to doing so, averagely rated at 2.6. The majority of the lower rating averages were in response to the statements measuring issues related to trust, suggesting that concerns regarding this aspect of sharing knowledge were seen as the least significant barriers to doing so.

Overall, the barriers to knowledge-sharing were perceived as significant by respondents, with the majority of statements receiving a rating average of >2.5. These results have particular significance for HSELanD administration in terms of guidance on addressing some of these perceived barriers. Despite this trend, 96% (n=174) of respondents answered the question in the fourth section of the questionnaire relating to their intention to share knowledge on HSELanD positively, with a rating average of 3.11 in respect of the statement which directly asked about their intention to do so. Perhaps most revealing regarding the question of underuse of HSELanD for knowledge-sharing was the response by 72.4% (n=131) of the sample that they were unaware of the existence of social media to enable this activity on the portal **(Table 5.7).**

Did you know that HSE employees can use social media (forums, blogs,wikis) to share knowledge on HSELanD?		
Answer Options	**Response Percent**	**Response Count**
Yes	27.6%	50
No	72.4%	131
	answered question	**181**
	skipped question	**0**

Table 5.7 Respondents awareness of knowledge sharing facilities on HSELanD

Figure 5.8 Barriers to sharing knowledge through social media on HSELanD

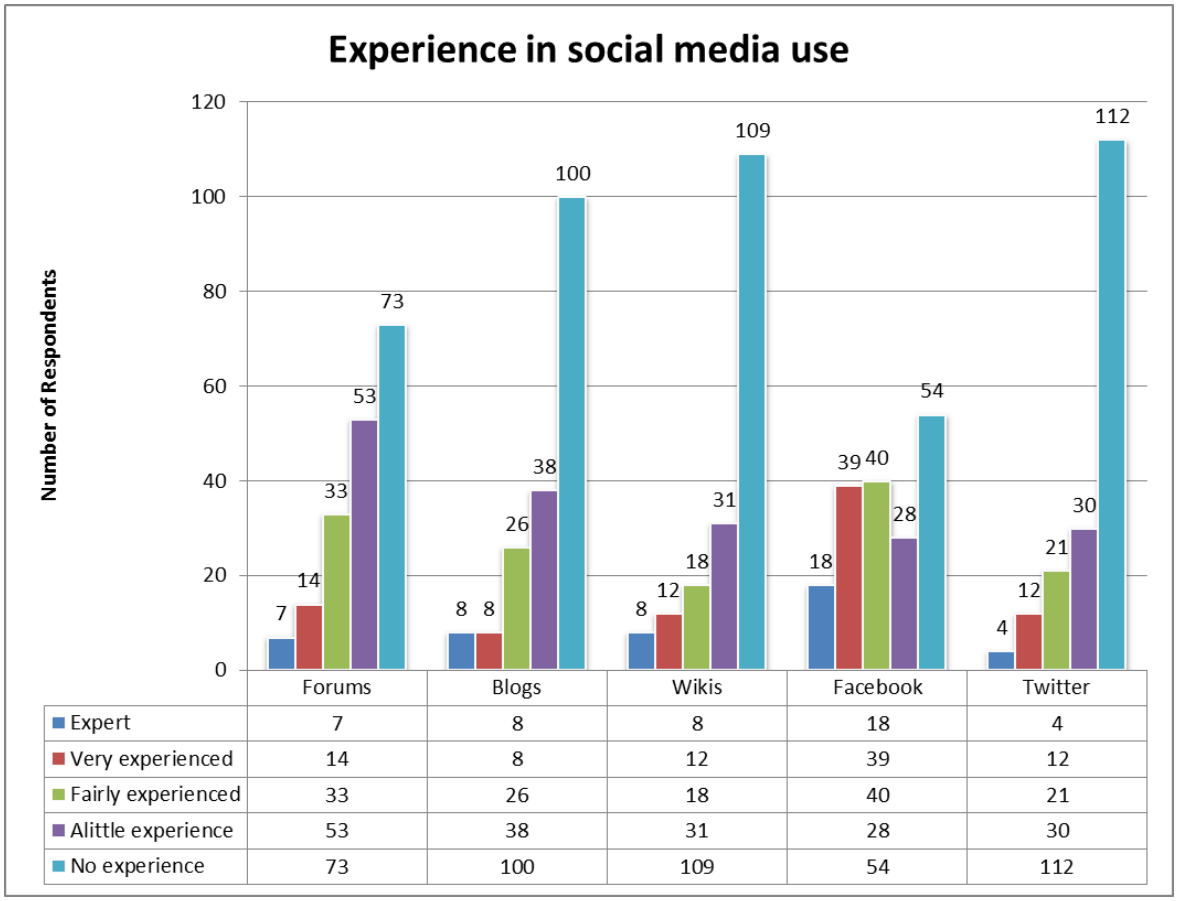


Figure 5.9 Respondents' experience in social media use

5.6 Results of qualitative analysis

Respondents had an opportunity in the questionnaire to add any free-text comments or suggestions they had on the topic of employees using HSELanD social media facilities to share knowledge. This option was availed of by 23% (n=41) of respondents and was evaluated and organised into themes representing the perspectives of the individuals who had provided their remarks (Creswell 2003). These themes were concerned generally with perceptions of issues related to barriers to sharing knowledge on HSELanD and are illustrated by **Table 5.8**. Barriers related to lack of time to access HSELanD and perceived training deficiencies in the use of the resource were the main obstacles identified, with lack of awareness of HSELanD, accessibility, usability and trust issues also reported. However, some comments revealing the altruistic characteristics of employees were also noted.

Qualitative Analysis Themes	No of responses
Lack of Time	12
Training Issues	11
Lack of Awareness of HSELanD	7
Accessibility/Usability	3
Altruism	3
Trust	3
Behavioural Intention	2

Table 5.8 Qualitative analysis themes

5.6.1 Lack of time to access HSELanD

Respondents' comments predominantly emphasised the lack of time at work to access HSELanD, while acknowledging the potential benefits, as the following comments indicate:

- "At work you don't have enough time to use the resource and at home you are less inclined to want to use it"
- "HSELanD is a great idea however nursing staff have no time at work to avail of it!"
- "One major barrier is time. People working on the wards simply don't have the time. Basic patient care is the most important thing. I understand and appreciate the need for further knowledge sharing but I would query how this can be achieved in current resources"
- "I work full-time but at home I need my free time. It should be more accessible at work"

Knowledge-sharing was seen as a positive activity, but seemed to be viewed as a work-based endeavour. These comments corroborate the findings of the statistical analysis referred to earlier which identified the lack of time as a major barrier to knowledge-sharing on HSELanD.

5.6.2 Training issues

The comments regarding training concerns highlighted employees' recognition of where they themselves needed to upskill, while demonstrating a positive attitude to sharing knowledge using social media on HSELanD if they had the ability, as these comments show:

- "I feel employees need mandatory sessions on how to use social media in order to share their knowledge with colleagues. I myself have used HSELanD but only briefly eg Manual handling online course but don't know how to use it to share knowledge"

- "A few sessions say in the HSE library to navigate HSELanD would help"
- "I have never used HSELanD and am not familiar with social media. Therefore I avoid it. Maybe some face-to-face induction sessions, or some training would break down those barriers. I would certainly undertake same if it were to be made available"

Employees appear to be willing to undergo training to equip them to use HSELanD to share knowledge, which is encouraging in light of the findings of the statistical analysis where the inability of employees to use social media was highlighted as a significant barrier to share knowledge.

5.6.3 Lack of awareness of HSELanD

Comments from respondents revealed that some had never even heard of HSELanD itself, and were therefore unaware of the provisions for knowledge-sharing, as these statements reveal:

- "Was not fully aware of HSELanD. Knew I had to enter it to complete manual handling but do not know much else about it"
- "Never heard of HSELanD before"
- "I believe there is a general lack of knowledge about the existence of HSELanD therefore this info needs to be put out there"

These comments are unsurprising in light of the statistical finding earlier that almost three quarters of respondents were unaware that they could use social media facilities on HSELanD to share knowledge with other employees.

5.6.4 Accessibility, usability and trust issues

Respondents in the sample complained of lack of access to computers at work, with one negative comment regarding ease of use. Concerns regarding trust in the competence of contributors were also raised, as illustrated in the following statements:

- "Often our computers are down in our workplace so therefore we cannot use them"
- "HSELanD is not very user friendly. No way to feedback. Difficulty accessing an adequate computer that doesn't crash every 5 minutes"
- "Social media should only be used as one of the references, i.e. not to rely on it alone or completely"
- "How does one know if knowledge shared is accurate?"

- "The main issue is the credibility and experience of the person posting; There is a risk, albeit a low one, that people could be misled on an issue of importance"

The statistical findings presented earlier regarding trust indicated that concerns regarding this aspect of sharing knowledge were seen as the least significant barriers to doing so, with the lowest rating averages of constructs relating to barriers in general. Nevertheless, keeping in mind that overall, the barriers to knowledge-sharing were perceived as significant by respondents, these comments may be characteristic of the particular concerns of healthcare employees about reliance on knowledge shared concerning critical health-related topics.

5.6.5 Altruism

Only one comment revealed that there was at least one active user of social media on HSELanD, while two respondents appeared to embrace the concept of knowledge-sharing for the common good, as their remarks show:

- "I have already written blogs and put my ideas forward through this media in HSELand"
- "I think it has huge potential for every speciality in nursing. By communicating and sharing our experiences and knowledge we have the ability to advance and share evidence based practice. In my own speciality of Oncology nursing it would be an invaluable tool"
- "There is always room for more knowledge and if we all work together to help each other then all to the good of the HSE and improve things for everyone, patients and relatives included"

These comments support the findings of the statistical analysis which demonstrated the highly motivating effect of altruism on attitude to knowledge sharing through social media on HSELanD. Finally, 2 comments were received regarding positive behavioural intention to access HSELanD to share knowledge as a result of having taken part in the study.

5.7 Discussion

This study attempted to discover the factors which motivate hospital employees and act as barriers to their knowledge-sharing in (VCoPs) on the HSELanD elearning portal by setting 6 research questions, namely:

- Are employees aware of the availability of knowledge-sharing opportunities in the "Practice Development Hubs"?

- Would employees feel motivated to share knowledge using social media on HSELanD?
- What do employees perceive to be the barriers to knowledge-sharing on HSELanD?
- Do employees feel confident in the use of the technology provided to share knowledge – blogs, forums, wikis?
- Do employees find HSELanD easy to use?
- Do employees believe that participating in knowledge-sharing in Practice Development Hubs is of value to them in their work?

The majority of respondents in the sample - 72.4 %(n=131) - revealed that they were unaware of the existence of social media to enable knowledge-sharing on HSELanD, while the results indicate that overall, employees would be motivated to share their knowledge by a combination of intrinsic and extrinsically motivating factors. Altruistic characteristics were shown to be significant determinants of employees' motivation to share their knowledge. Respondents perceive knowledge-sharing as useful and relevant, regarding reciprocity and recognition by superiors as important factors, while external rewards in the form of opportunities for promotion, financial rewards or chances to show off were reported as the least motivating factors. These findings are in line with results of previous research, which was expounded upon in chapter 3.

Generally, the barriers to knowledge-sharing were perceived as significant by respondents. The lack of time at work to access HSELanD and disinterest in pursuing knowledge-sharing using the portal outside of work time was clearly indicated by responses received. Accessibility and usability issues surfaced also as HSELanD was reported as user-unfriendly and difficult to navigate, with many having problems accessing a computer at work. This is interesting, as 99.4% (n=180) of respondents reported having access to the Internet, with 80.1% having access at work, therefore emphasising the message that HSELanD and its' resources, including the facility to engage with VCoPs, is seen as a work-related activity, to be undertaken during working hours. Lack of time was identified as a major barrier also in the studies referred to earlier in the literature review, however the finding in this study that employees would confine engagement with work-related VCoPs to their working hours, despite their generally altruistic motives regarding knowledge-sharing, is novel, and stimulates the question of whether this attitude may be due to cultural influences. In fact, 40.9% (n=74) of the sample reported having attempted to join a practice development hub on HSELanD with almost all of those being accepted as members, implying that the altruistic motives are present but, in the absence of allocated time at work to dedicate to the

activity, members remain silent. A case study examining a successful and active VCoP in the USA of over 10 years standing – the advanced practice nurses listserv – was described by Hara & Few (2007), but this study did not make any reference to time as an issue of contention.

The training needs of employees to use social media for knowledge-sharing are highlighted by the results of this study, specifically in the area of social media use, considering that high levels of computer and Internet self-efficacy were reported by the sample, as well as a majority positive attitude to the usefulness of computers in their jobs (96%, n=175). Respondents indicated a willingness to undertake training and their intention to share knowledge, with the relevant statistical results being backed up by the free-text comments on the questionnaire.

This study revealed inconsistency in the responses related to knowledge self-efficacy – an individuals' perceived competence and motivational factor; although the majority reported no reluctance to share knowledge due to any concerns about their own knowledge self-efficacy in terms of their motivation, a sizeable portion of responses revealed concern that this could be a barrier to their contributions when presented with examples in the form of statements in question 8, for example, fear of criticism, fear of their ignorance being exposed and self-doubt regarding the importance and reliability of their contributions. This is essentially a personal, individual concern and as participation in VCoPs is optional and voluntary, it is likely that contributing members would be individuals who perceive themselves as capable members. Trust in the competence of other contributors was not shown to be a concern of respondents affecting motivation to share their knowledge in this study, however the results are somewhat conflicting, as statements of barriers reflecting this construct generated significant rating averages, albeit among the lowest ones, in the answers to question 8, for example, doubts about the quality of knowledge shared and in the integrity of contributors who might claim the ideas of others as their own. Perhaps an element of uncertainty and inexperience regarding the medium of communication, especially in the light of the unfamiliarity with it, may partially explain this result.

Respondents in this study were positive regarding the value and relevancy of knowledge-sharing as a useful, beneficial activity in the workplace, concurring with the previously reviewed studies highlighting the importance of PU in determining technology use. In light of the finding that 72.4% (n=131) of the sample were unaware that HSELanD enabled this endeavour, it is possible that the perception that 'it is just another information system' (reported as a highly influential barrier) is more reflective of ignorance of this fact than indifference.

5.8 Conclusion

This chapter presented and discussed the quantitative and qualitative results acquired from the analysis of the survey data. Discussion of the results revolved around consideration in the light of previous relevant research findings and in the context of HSELanD. The finding that 72.4% of respondents were unaware of the facility to share knowledge using social media on HSELanD is likely to partly explain its underuse, given the apparent motivation and altruistic characteristics of employees revealed by their responses. Valuing knowledge-sharing as relevant and useful, employees expressed that reciprocity and recognition by their superiors would motivate them, while external rewards such as financial reward or promotion opportunities were least motivating. The findings showed that while employees' motivation is not in doubt, they perceive that significant barriers to their participation do exist, including lack of awareness of the resource, training needs, data protection concerns, lack of time to use it, portal usability problems and the issue of recognition of their contributions. This study now turns to the conclusions which may be drawn from this research, recommendations for HSELanD management and for future research and addresses the study limitations.

Chapter 6 Conclusions and Future Work

6.1 Introduction

Motivated by a need to understand the factors affecting employee participation in knowledge-sharing on HSELanD, this study incorporated principles of motivational theory with the technology acceptance model into a study design which aimed to discover the motivations and barriers to knowledge-sharing using social media in this setting. The results, detailed in the previous chapter, showed that while employees' motivation is not in doubt, they perceive that significant barriers to their participation do exist. In this chapter, conclusions are drawn from the study analysis and the implications for HSELanD administration are presented. The limitations of this study are acknowledged and suggestions for future research are advanced for consideration.

6.2 Conclusions and Implications for HSELanD Administration

The findings of this study demonstrate the importance of the support of management in order to maximise the return on investment from the provision of VCoPs in a KM initiative. Ensuring that employees are aware of the resource and that they know its usage is endorsed by management can encourage knowledge-sharing within the organisation. It is also the role of management to convey the benefits of knowledge-sharing to their employees and to internally market the VCoPs in order to bolster their usage (Paroutis & Al Saleh 2009). Training for employees in the use of Web 2.0 tools cannot be overlooked, as a lack of proficiency in the use of technology could significantly impact on the uptake of this forum for communication and collaboration (Ardichvili 2008). PEOU was shown to be strongly significant in several studies which examined its' influence on technology use, particularly the use of social software (Ye *et al*. 2006, Hsu & Lin 2008, Kim 2012, Papadopoulos *et al.* 2012). Through training for knowledge-sharing, Gagné (2009) asserts that a medium exists through which an organisation has a chance to teach the relevant skills, what knowledge to share and to create norms about sharing behaviour. This is of particular relevance in the case of HSELanD, where the establishment of pro-sharing norms is required to address the current lack of reciprocity benefit (receiving knowledge in return) as an important motivator for the current few contributors (Kankanhalli *et al.* 2005), especially as the respondents in this study regarded 'hard' rewards as least motivating them to share their knowledge, in line with results of previous research.

It seems reasonable to conclude that attention to the perceived barriers to employees' participation in knowledge-sharing should go some way towards enabling a motivated workforce to take part in this activity and some managerial implications can be derived from the study findings, as follows:

- Ensure that employees are aware of the secure knowledge-sharing resources on HSELanD, for example, by staging nationwide promotional events in hospitals/community health facilities, or disseminating promotional material via internal email, or advertising the resources in relevant publications of interest to health professionals. Use this opportunity to advise employees of the mutual benefits of sharing knowledge and expertise with members of their own profession and with those from other professions.

- Address perceived training needs identified by the study - training to use blogs, wikis and forums. This could be approached by engaging the services of HSE library personnel.

- Review the usability of HSELanD and opportunities for user feedback, taking into account the findings of the study regarding perceived ease of use.

- Provide employees and (potential) contributors to VCoPs on HSELanD with relevant links to guidance from professional bodies regarding social media use (N.M.B.I. 2012), to help allay concerns regarding data protection.

- To help address the establishment of pro-sharing norms, confer with relevant management levels of each professional discipline with the aim of reaching a consensus that time spent on sharing professional knowledge and insights via social media on HSELanD constitutes a valid use of work time, when there is time to do so.

- Consider how to implement some form of 'soft reward' system in order to recognise members' contributions to the virtual communities of practice (VCoPs) on HSELanD, for example, a recognition programme (Paroutis & Al Saleh 2009) where the 'most active forum' or 'top-rated blog posting' is profiled publicly on the individual hospital/facility's newsletters from where the contributions originated. Contributors' perceptions of their knowledge self-efficacy and therefore their motivation could be also enhanced by a personal acknowledgment of their contributions by the VCoP moderators.

- Aimed at creating a sense of community and belonging (Ardichvili 2008), consider incorporating an optional video facility into HSELanD (such as Skype) to facilitate face-to-face interactions in order to address issues around trust and to enable videoconferences.

6.3 Limitations

There are important limitations of this study to be noted, affecting the validity of the data, representativeness of the sample and the generalizability of the findings. The number of responses was disappointing and lower than anticipated; however, the results are nonetheless

important and valuable insights into factors perceived by employees as barriers to knowledge-sharing in VCoPs in the HSELanD context may offer some guidance to management in addressing these issues.

First, the response rate was low (12.2%) and was difficult to calculate due to the inclusion of the Internet-based data collection method. Second, it is possible the results may be biased by the self-selection of participants; respondents may be more motivated than those who chose not to take part and the incentive of the draw prize may have been a further (or the only) source of motivation. Third, the results are generated from a non-probability, convenience sample, where certain professions were over-represented, thereby limiting the generalizability of the findings. Finally, the study setting is also the researchers' place of work, which may also have affected the motivation of respondents.

6.4 Future Research Recommendations

This study generated some interesting insights into the motivation of HSE employees to share their knowledge with others in VCoPs and identified the barriers perceived as preventing them from doing so. A qualitative study of the same research problem would be interesting in terms of comparison of the results and would likely complement the findings of this study. A plan for a future, larger-scale, national study, perhaps across various health-care settings, could benefit from the findings of this pilot study. Future research could focus on the aspect of time constraints as a particular barrier to knowledge-sharing, and whether the perception that knowledge-sharing in work-related VCoPs should take place during work time is a cultural phenomenon, only found in the Irish health-care context.

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Appendix A – Hard copy questionnaire

Each question is optional. Feel free to omit a response to any question; however the researcher would be grateful if all questions are responded to.

Understanding Participation in Knowledge-Sharing in Virtual Communities of Practice on the HSELanD elearning Portal

Computers, The Internet and You

The questions in this section are about your experience in the use of a computer and using the Internet. You will also be asked how familiar you are with social media facilities, like blogs, forums and wikis, which are offered by HSELanD.

1. Please consider the following statements and rate your level of agreement/disagreement with the help of the scale given.

	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
I consider myself an experienced user of computers	O	O	O	O	O
I am experienced in using e-mail	O	O	O	O	O
I am experienced in using the Internet	O	O	O	O	O
I need more training in basic computer skills	O	O	O	O	O
I need more training to use social media, e.g. forums, blogs, wikis	O	O	O	O	O
I find computers useful in my job	O	O	O	O	O
I believe that computers in health care will create more work for employees	O	O	O	O	O

2. How experienced are you in using the following:

	Expert	Very experienced	Fairly experienced	A little experienced	No experience
Forums	O	O	O	O	O
Blogs	O	O	O	O	O
Wikis	O	O	O	O	O
Facebook	O	O	O	O	O
Twitter	O	O	O	O	O

3. Where do you have access to the Internet?

O At work O At home O Mobile access (Phone/iPad) O No access

4. Did you know that HSE employees can use social media (forums, blogs, wikis) to share knowledge on HSELanD?

O Yes O No

5. Have you ever tried to sign up to any of the "Practice Development Hubs" on HSELanD?

O Yes O No

6. If you have answered 'Yes' to Q5, have you very been refused access to any of the "Practice Development Hubs" on HSELanD?

O Yes O No

Each question is optional. Feel free to omit a response to any question; however the researcher would be grateful if all questions are responded to.

Knowledge Sharing Motivation

This section contains a set of statements which you are asked to rate with the help of the rating scale given. The aim of this part of the questionnaire is to help to understand your motivation to share knowledge through the platform of social media.

7. What would motivate you to share knowledge through social media (forums, blogs, wikis) on HSELanD?

	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
I want to help the HSE to reach its goals	O	O	O	O	O
I enjoy helping my colleagues by sharing my knowledge	O	O	O	O	O
I would expect to receive knowledge in return if I had contributed knowledge already	O	O	O	O	O
I think that learning to operate forums, blogs, and wikis would be easy for me	O	O	O	O	O
Using social media (forums, blogs, and wikis) is easy for me	O	O	O	O	O
Sharing knowledge is part of my job	O	O	O	O	O
My links to other colleagues from all professions could be improved if I am seen to share my knowledge	O	O	O	O	O
Writing and commenting on blogs and forums can help other employees with similar problems.	O	O	O	O	O
I think that sharing knowledge with other employees would help me in my job	O	O	O	O	O
I am confident in my ability to provide knowledge that other employees using HSELanD would consider valuable	O	O	O	O	O
I think that sharing knowledge with other employees is beneficial in healthcare	O	O	O	O	O
I would trust the information and knowledge provided by other employees using social media on HSELanD	O	O	O	O	O
I would contribute to knowledge-sharing forums on HSELanD without expecting benefits	O	O	O	O	O
I want to achieve my own goals	O	O	O	O	O
Knowledge-sharing with other employees in the HSE is valuable	O	O	O	O	O
If my participation in knowledge-sharing on HSELanD was recognised by colleagues and superiors, I would be more motivated to share my knowledge	O	O	O	O	O
I want to show off my experience	O	O	O	O	O
Using social media to share knowledge on HSELanD could make my employment more secure	O	O	O	O	O
I want to receive financial reward in return for my knowledge sharing	O	O	O	O	O
Using social media to share knowledge on HSELanD could lead to opportunities for promotion	O	O	O	O	O

Barriers to Knowledge Sharing

This section examines what barriers there may be which could prevent you from sharing your knowledge through social media on HSELanD. Again, there is a set of statements which you are asked to evaluate from your point of view with the help of the scale given.

Each question is optional. Feel free to omit a response to any question; however the researcher would be grateful if all questions are responded to.

8. What would prevent you from sharing knowledge using social media on HSELanD?

	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
It takes too much time and effort	O	O	O	O	O
It is just another information system	O	O	O	O	O
I don't always have access to a computer at work when I need it	O	O	O	O	O
I have no time at work to access HSELanD	O	O	O	O	O
I am not interested in accessing HSELanD outside of work -time to share knowledge using social media	O	O	O	O	O
HSELanD is not user-friendly	O	O	O	O	O
I find it difficult to find what I'm searching for on the HSELanD portal	O	O	O	O	O
I might not get enough knowledge in return	O	O	O	O	O
I am afraid that other employees might claim my ideas as their own	O	O	O	O	O
I feel insecure about how my knowledge might be received and understood	O	O	O	O	O
I do not think that employees using social media is useful in the healthcare environment	O	O	O	O	O
I do not believe that I can get good quality knowledge from the social media sources on HSELanD	O	O	O	O	O
I would not be adequately rewarded for sharing my knowledge on HSELanD	O	O	O	O	O
I do not think that my knowledge is important enough	O	O	O	O	O
I am not sure whether my knowledge is reliable	O	O	O	O	O
I am afraid of criticism from other employees using HSELanD social media	O	O	O	O	O
I do not want to share my knowledge with people I do not know well	O	O	O	O	O
I am afraid of losing ownership of the knowledge	O	O	O	O	O
I am afraid that I reveal what I don't know people will think I am not as proficient as they had expected	O	O	O	O	O
I do not know how to use social media	O	O	O	O	O
I am concerned about breaking Data Protection laws if I use social media on HSELanD to discuss work topics	O	O	O	O	O

Your Intention to Share Knowledge

This section assesses your knowledge-sharing intention on HSELanD. You are asked to rate the statements with the help of the rating scale given.

9. Please consider the following statements and rate your level of agreement/disagreement with the help of the scale given.

	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
I intend to share my knowledge through social media with other employees on HSELanD	O	O	O	O	O
I will try to share my knowledge through social media with other employees on HSELanD	O	O	O	O	O

Each question is optional. Feel free to omit a response to any question; however the researcher would be grateful if all questions are responded to.

Please add any comments or suggestions you would like to make in the box underneath on the topic of employees using social media to share knowledge on HSELanD.

Demographics

The information you provide here will be used solely to aid in the analysis and interpretation of the data collected in this research study. All responses are confidential and will be recorded anonymously. Your identity and contact details (if provided) will be kept separately from your questionnaire response and only used for the purpose of the draw.

10. Which category below includes your age?

O 18-30 O 31-40 O 41-50 O 51-60 O 60+

11. Gender:

O Female O Male

12. What is the highest level of education you have completed?

O Secondary school O Certificate O Diploma

O Bachelors Degree O Masters Degree ODoctoral Degree

O Other (please specify): _____

13. What is your profession/current job title?

14. Which of the following best describes your position at work?

O Director O Senior Manager O Line Manager

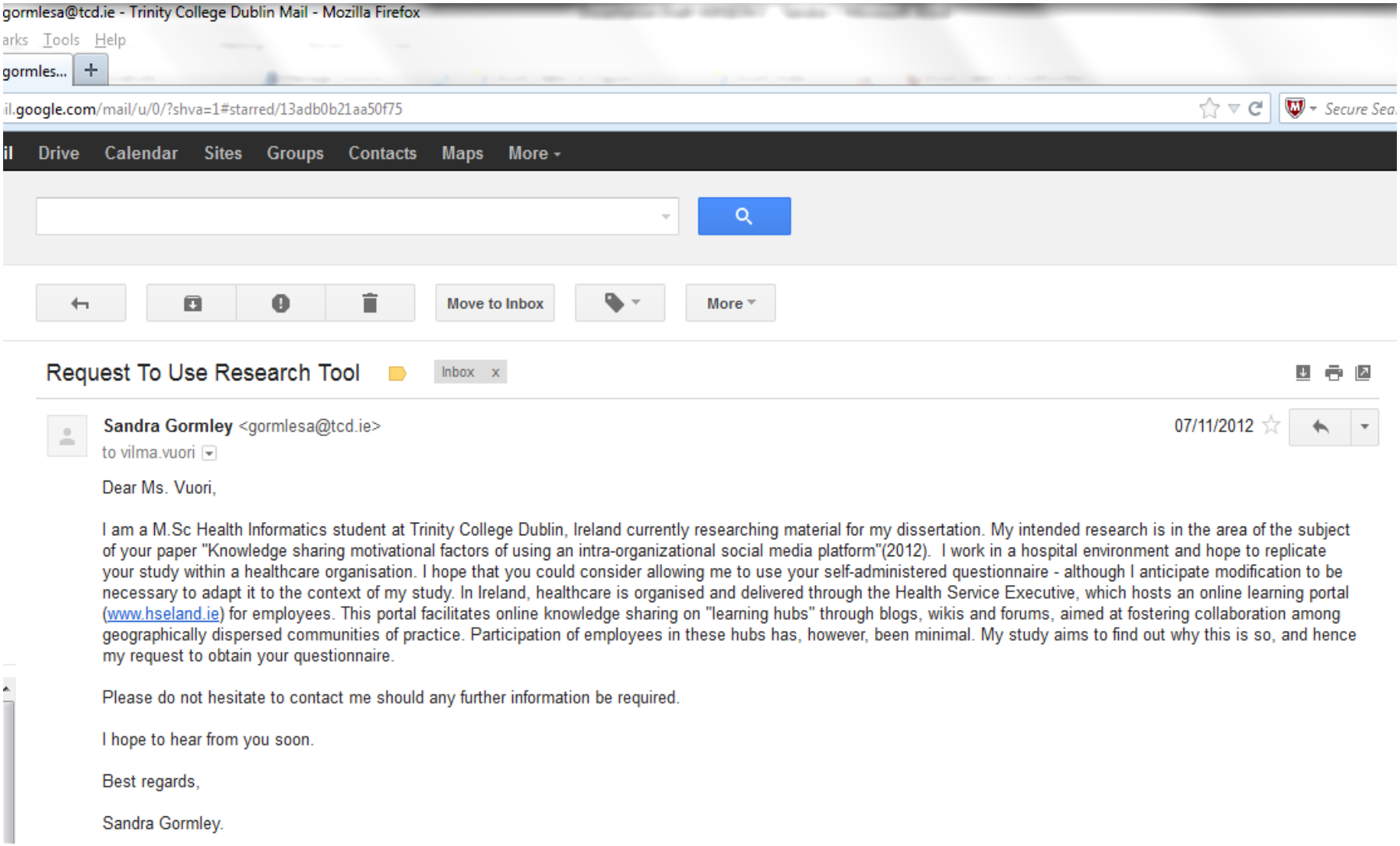
O Staff O Other (please specify): _____

15. Please provide your name and contact details below (optional), if you would like to enter a draw for a € 50 One4all Gift Voucher. All respondents who complete the questionnaire and provide their contact details will be entered into the draw which will be held on 24th December 2012. Thank you very much for taking part in this research and Good Luck in the Draw!

Name & Contact Details:

Thank you for taking the time to complete this Questionnaire – Please return it to the Envelope provided.

Appendix B - Email request for permission to use questionnaire items



gormlesa@tcd.ie - Trinity College Dublin Mail - Mozilla Firefox

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il.google.com/mail/u/0/?shva=1#starred/13adb0b21aa50f75

Secure Sea

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Move to Inbox More

Request To Use Research Tool Inbox x

Sandra Gormley <gormlesa@tcd.ie> 07/11/2012

to vilma.vuori

Dear Ms. Vuori,

I am a M.Sc Health Informatics student at Trinity College Dublin, Ireland currently researching material for my dissertation. My intended research is in the area of the subject of your paper "Knowledge sharing motivational factors of using an intra-organizational social media platform"(2012). I work in a hospital environment and hope to replicate your study within a healthcare organisation. I hope that you could consider allowing me to use your self-administered questionnaire - although I anticipate modification to be necessary to adapt it to the context of my study. In Ireland, healthcare is organised and delivered through the Health Service Executive, which hosts an online learning portal (www.hseland.ie) for employees. This portal facilitates online knowledge sharing on "learning hubs" through blogs, wikis and forums, aimed at fostering collaboration among geographically dispersed communities of practice. Participation of employees in these hubs has, however, been minimal. My study aims to find out why this is so, and hence my request to obtain your questionnaire.

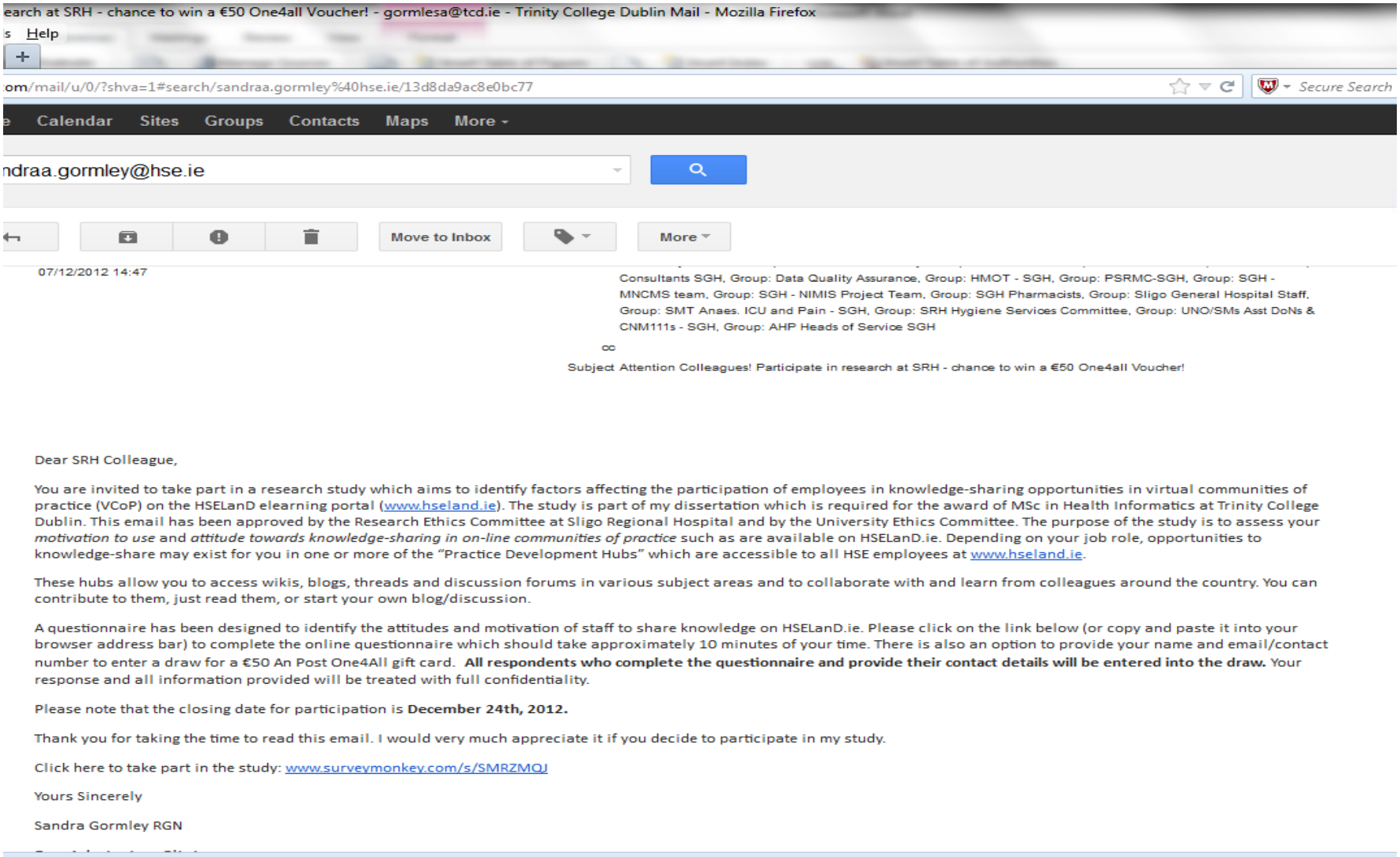
Please do not hesitate to contact me should any further information be required.

I hope to hear from you soon.

Best regards,

Sandra Gormley.

Appendix C - Email invitation to participate in study



earch at SRH - chance to win a €50 One4all Voucher! - gormlesa@tcd.ie - Trinity College Dublin Mail - Mozilla Firefox

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om/mail/u/0/?shva=1#search/sandraa.gormley%40hse.ie/13d8da9ac8e0bc77

Secure Search

Calendar Sites Groups Contacts Maps More

ndraa.gormley@hse.ie

Move to Inbox More

07/12/2012 14:47

Consultants SGH, Group: Data Quality Assurance, Group: HMOT - SGH, Group: PSRMC-SGH, Group: SGH - MNCMS team, Group: SGH - NIMIS Project Team, Group: SGH Pharmacists, Group: Sligo General Hospital Staff, Group: SMT Anaes. ICU and Pain - SGH, Group: SRH Hygiene Services Committee, Group: UNO/SMs Asst DoNs & CNM111s - SGH, Group: AHP Heads of Service SGH

cc

Subject Attention Colleagues! Participate in research at SRH - chance to win a €50 One4all Voucher!

Dear SRH Colleague,

You are invited to take part in a research study which aims to identify factors affecting the participation of employees in knowledge-sharing opportunities in virtual communities of practice (VCoP) on the HSELanD elearning portal (www.hseland.ie). The study is part of my dissertation which is required for the award of MSc in Health Informatics at Trinity College Dublin. This email has been approved by the Research Ethics Committee at Sligo Regional Hospital and by the University Ethics Committee. The purpose of the study is to assess your *motivation to use* and *attitude towards knowledge-sharing in on-line communities of practice* such as are available on HSELanD.ie. Depending on your job role, opportunities to knowledge-share may exist for you in one or more of the "Practice Development Hubs" which are accessible to all HSE employees at www.hseland.ie.

These hubs allow you to access wikis, blogs, threads and discussion forums in various subject areas and to collaborate with and learn from colleagues around the country. You can contribute to them, just read them, or start your own blog/discussion.

A questionnaire has been designed to identify the attitudes and motivation of staff to share knowledge on HSELanD.ie. Please click on the link below (or copy and paste it into your browser address bar) to complete the online questionnaire which should take approximately 10 minutes of your time. There is also an option to provide your name and email/contact number to enter a draw for a €50 An Post One4All gift card. **All respondents who complete the questionnaire and provide their contact details will be entered into the draw.** Your response and all information provided will be treated with full confidentiality.

Please note that the closing date for participation is **December 24th, 2012.**

Thank you for taking the time to read this email. I would very much appreciate it if you decide to participate in my study.

Click here to take part in the study: www.surveymonkey.com/s/SMRZMQJ

Yours Sincerely

Sandra Gormley RGN

Appendix D – Poster advertising study

Appendix E - List of hospital departments for hard copy questionnaire distribution

- Renal dialysis
- ICT Department (Information and Communications Technology)
- Laboratory
- Pre-Admission Assessment Clinic
- Pharmacy
- Physiotherapy
- Occupational Therapy
- Radiology
- Library
- Cardiac Investigations Department
- Endoscopy
- Out-Patients Department
- Emergency Department
- Oncology Ward
- Acute Medical Assessment Unit
- Hospice
- Ophthalmic Department
- General Medical Wards x 3
- General Surgical Wards x 2
- Orthopaedic Ward
- Day Services Unit
- Maternity Ward
- General Theatre
- Orthopaedic Theatre
- Cardiac Rehabilitation Department
- Paediatric Department
- Coronary Care Unit
- Intensive Care Unit
- Dietetic Department
- Student Clinical Placement Co-ordinators

Appendix F - Follow-up email

Fw: Research Participation Reminder - Closing date Monday 24th December - €50 One4all Voucher to be won! Inbox x

SandraA.Gormley@hse.ie
to me

Sandra Gormley/NWHB

17/12/2012 17:16

To Group: Clinical Audit SGH, Group: Clerical Supervisors SGH, Group: Clinical Nurse Specialists SGH, Group: CNM-M.Ryder area, Group: CNM11's theatres only, Group: CNMII SGH, Group: CNMIIs Theatre Specialities, Group: Consultants SGH, Group: Data Quality Assurance, Group: HMOT - SGH, Group: PSRMC-SGH, Group: SGH - MNCMS team, Group: SGH Pharmacists, Group: Sligo General Hospital Staff, Group: SMT Anaes. ICU and Pain - SGH, Group: SRH Hygiene Services Committee, Group: UNO/SMs Asst DoNs & CNM111s - SGH, Group: AHP Heads of Service SGH

cc

Subject Research Participation Reminder - Closing date Monday 24th December - €50 One4all Voucher to be won!

Dear Colleagues,

Thank you all very much for responding to my request for research participants - I very much appreciate your time and effort to complete the questionnaires. For anone still thinking of taking part, you can do so until next Monday 24th December - its at www.surveymonkey.com/s/SMRZMQJ - (you can copy and paste this link into the browser address bar above if it doesn't take you straight to the questionnaire) or you can find hard copies of the questionnaire in all hospital departments.

Many thanks

Yours sincerely

Sandra Gormley RGN
Pre-Admission Clinic, Level 3, SRH. ext.4216

Appendix G - Research study ethical approval – Sligo Regional Hospital

Feidhmeannacht na Seirbhíse Sláinte
Health Service Executive

Research Ethics Committee
Sligo General Hospital
The Mall
Sligo
Chairman Dr. John Williams
Adm. Mette Jensen Kavanagh

Sandra Gormley
2 The Dunes
Strandhill
Sligo

November 29th 2012

Re. Research Ethics Application

Dear Ms Gormley,

The Research Ethics Committee (REC) at Sligo General Hospital has received your submission for ethical review of the study "*Understanding participation in knowledge sharing in virtual communities of practice on the HSELanD elearning portal*".

The study underwent expedited review and the REC Chairman has given a **favourable ethical opinion** for the study.

Documents reviewed:

- Application form
- Protocol
- Questionnaire
- Invitation Leaflet
- PI CV

The REC requires that approved studies submit an annual report to the REC. The annual report for the above study is due on January 30th 2014.

Yours sincerely,

Dr. John Williams
Chairperson

Appendix H - Research study ethical approval – Trinity College Dublin

Research Ethics <research-ethics@scss.tcd.ie> 03/12/2012

to Bridget, me

Dear Sandra,

Thank you for your application for research ethics approval. As you have received external ethical approval, no further ethical approval is required from the SCSS Research Ethical Committee. I will keep a copy of your application and approval for our records.

Kind regards

Gillian

Appendix I - **Participant Information Sheet**

Pre-Admission Clinic
Sligo Regional Hospital
(071) 9171111 ext.4216
Email: gormlesa@tcd.ie Mobile no: (087)6806775

INFORMATION SHEET FOR PARTICIPANTS

Understanding participation in knowledge-sharing in virtual communities of practice on the *HSELanD* elearning portal

Dear Colleague,

You are invited to take part in a research study which aims to identify the factors affecting the participation of employees in knowledge-sharing opportunities in virtual communities of practice (VCoP) on the HSELanD elearning portal (www.hseland.ie). This study is part of my dissertation for the MSc in Health Informatics at Trinity College Dublin. The study has been reviewed and approved by the Research Ethics Committees at Sligo Regional Hospital and at Trinity College. Please take time to read the following information and discuss it with others if you wish. It is up to you to decide whether or not to take part. All information provided in your response will be kept confidential. No information will be sold or rented or used for any commercial purpose. You are free to withdraw at any time and without giving a reason.

The purpose of the study is to assess your *motivation to use* and *attitude towards knowledge-sharing in on-line communities of practice* such as are available on HSELanD.ie. Depending on your job role, opportunities to share knowledge may exist for you in one or more of the "Practice Development Hubs" which are accessible to all HSE employees at www.hseland.ie. These hubs allow you to access wikis, blogs, threads and discussion forums in various subject areas and to collaborate with and learn from colleagues around the country. You can contribute to them, just read them or start your own blog/discussion.

A questionnaire has been designed to identify the attitudes and motivation of staff to share knowledge on HSELanD.ie. Filling out the questionnaire should take approximately 10 minutes of your time and is not expected to involve risks greater than those ordinarily found in daily life.

The questionnaire contains 15 questions which you are asked to answer using scales given beside each statement/question. At the end, there are some questions regarding your age, gender, level of education, and profession. The purpose of gathering this personal information is not to identify the study participant but to help with analysis of the data. There is an **option** to provide your name and email/contact number also to enter a draw for a €50 An Post One4All gift card. All respondents who complete the

P.T.O.

questionnaire and provide their contact details will be entered into the draw which will be held on 24th December 2012. You may then place the questionnaire in the special envelope I have provided at your workplace, or submit it electronically – if you have completed the on-line version.

All Sligo Regional Hospital staff are being invited to participate in this study. Study results may be published in peer reviewed journals and conference presentations. No research participant will be identifiable from any publications. It is planned to disseminate the research in dissertation form within Trinity College Dublin, including a presentation to postgraduate colleagues also undertaking the Masters in Health Informatics and lecturers from the Computer Science Department. Considerable interest in the study has also been expressed by HSELanD administration. Individual results will be aggregated anonymously and research reported on aggregate results, which will then be available to individual participants from the researcher on request.

Please do not name third parties in any open text field of the questionnaire. Any such replies will be anonymised. In the extremely unlikely event that illicit activity is reported to me during the study I will be obliged to report it to appropriate authorities.

Please contact me if you need further information.

Yours sincerely,

Sandra Gormley RGN – Researcher

Date: 22nd November 2012

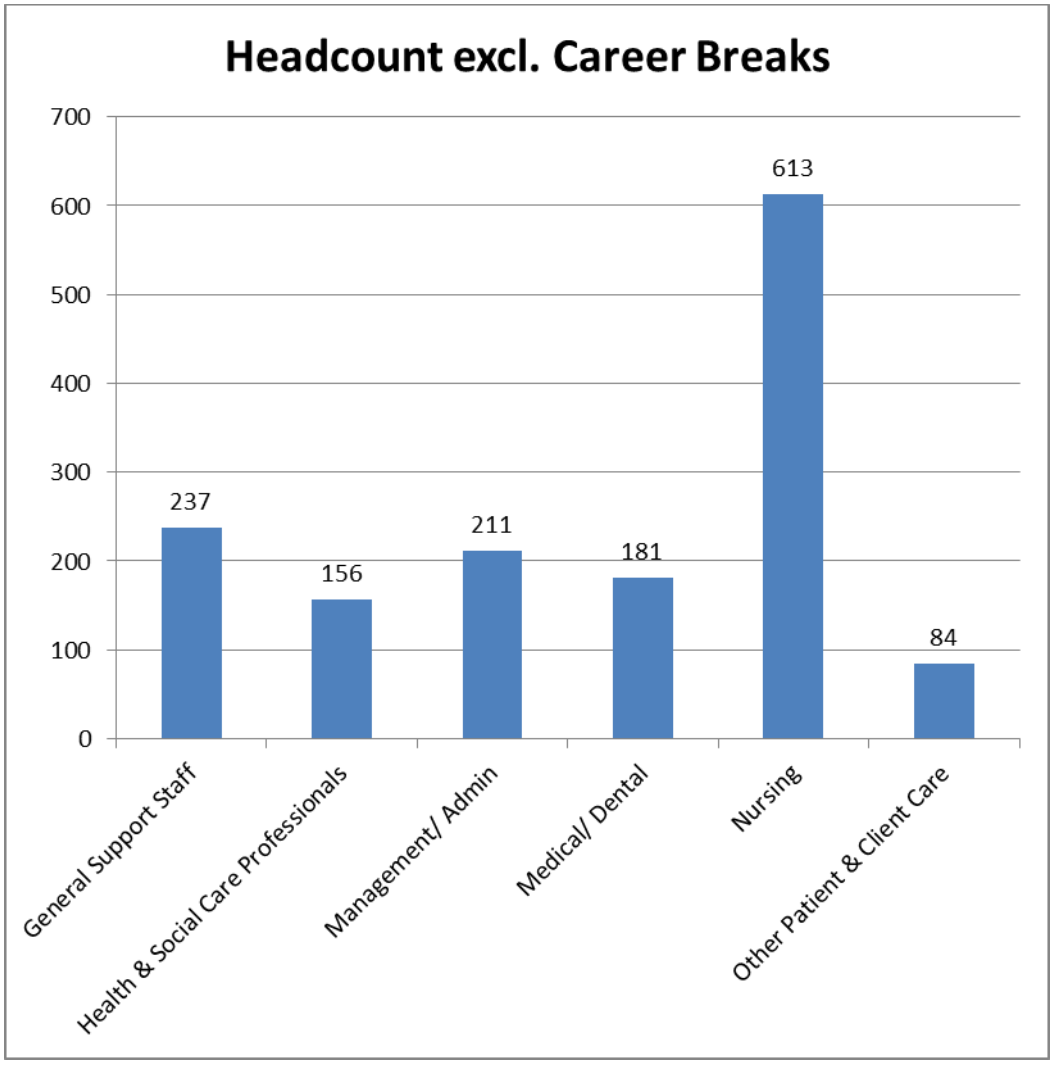
Participant's Declaration:

I have read and understand the above information sheet and, by proceeding to complete the questionnaire, I indicate my willingness to voluntarily take part in the study.

Appendix J - Headcount report – Sligo Regional Hospital November 2012

High Level Discipline	Headcount excl. Career Breaks
General Support Staff	237
Health & Social Care Professionals	156
Management/ Admin	211
Medical/ Dental	181
Nursing	613
Other Patient & Client Care	84
Total Headcount for Sligo Regional Hospital	1482

Headcount report November 2012



Breakdown of Employee Numbers per Discipline - Sligo Regional Hospital November 2012