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Modelling the development of an
Online Learning Resource by Health Care
Professionals.

(Volume 1 of 2)

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Thesis submitted in fulfilment of the requirements for Degree of Doctor
of Philosophy in Health Science

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Abstract

The aim of this study was to model the process of development for an Online Learning Resource (OLR) by Health Care Professionals (HCPs) to meet lymphoedema-related educational needs, within an asset-based management context. Previous research has shown that HCPs have unmet educational needs in relation to lymphoedema but details on their specific nature or context were lacking. Against this background, the study was conducted in two distinct but complementary phases.

In Phase 1, a national survey was conducted of HCPs predominantly in community, oncology and palliative care services, followed by focus group discussions with a sample of respondents. In Phase 2, lymphoedema specialists (LSs) used an action research approach to design and implement an OLR to meet the needs identified in Phase 1. Study findings were analysed using descriptive statistics (Phase 1), and framework, thematic and dialectic analysis to explore their potential to inform future service development and education theory.

Unmet educational need was found to be specific to health care setting and professional group. These resulted in HCPs feeling poorly-equipped to diagnose and manage lymphoedema. Of concern, when identified, lymphoedema was sometimes buried for fear of overwhelming stretched services. An OLR was identified as a means of addressing the unmet educational needs. This was successfully developed and implemented with minimal additional resources. The process model created has the potential to inform contemporary leadership theory in asset-based management contexts.

This doctoral research makes a timely contribution to leadership theory since the resource constraints underpinning much of the contribution has salience to current public services. The process model created has the potential to inform contemporary leadership theory in asset-based management contexts. Further study of a leadership style which incorporates cognisance of Cognitive Load Theory and Self-Determination Theory is suggested. In addition, the detailed reporting of process and how this facilitated learning for participants contributes to workplace education theory.

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Preface: structure and format of thesis

The research on which this thesis is based was undertaken over five years, and is presented in two distinct but complementary phases.

Phase 1 is based on a study supported by NHS Education for Scotland (NES). In this phase, the researcher's position was as an outside, objective observer. She used mixed methods to identify the educational needs of health care professionals (HCPs) regarding the condition lymphoedema. Note that, for the purposes of this study educational need refers to a need in a given population, whereas a learning need refers to an individual. In practice many HCP use the term training, particularly when referring to practical skills such as bandaging and identification of skin changes. Therefore, where specific to the data collected, these terms are used e.g. responses to questions in Phase 1, otherwise the term education will be used as an umbrella term.

Phase 2 did not have external funding and relied on an asset-based principle i.e. utilising existing resources. In this, the researcher adopted an action research approach in order to address some of the findings of the earlier phase. This involved working with peers during five cycles of action to develop an on-line learning resource (OLR) for HCPs. For the purposes of this thesis OLR means an online point of reference for HCP to access in relation to lymphoedema management; the learning being salient to the user at point of seeking information and contextualised by its application in practice. During Phase 2, the researcher position shifted to that of an insider utilising a reflexive approach that recognised the influence of the researcher on the study.

Chapter 1 summarises the local and wider background to the study as a whole.

Chapters 2 - 7 relate to Phase 1 of the research, specifically the literature, research questions, methodology, methods, results and discussion.

Chapter 8 then describes the transition of the research from Phase 1 into Phase 2 and outlines the research aim and questions for Phase 2.

Chapter 9-12 relate to Phase 2 of the research, specifically the research aim and questions, literature, methodology, study design, findings and discussion.

Chapter 13 discusses the learning gained from the entire study.

At a superficial level this work represents a pragmatic response to an educational need in an increasingly resource-pressured and low-profile area of health care service. At a deeper level the study explored, by modelling the process, what theories tacitly influenced and informed the collaborative endeavours of HCPs to fulfil their educational role. In addition, the thesis represents the learning of the author as research knowledge and skills develop. As such, Phase 1 has not been polished or airbrushed with the benefit of hindsight, the learning gained is reflected upon in the final chapter.

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Underpinning everything has been the backing of my remarkable family. I would not be at this point if it were not for the unwavering support of my parents and the positivity (and pragmatism) of my children, Lowri and Jonathan, and stepdaughter Gemma, who inspire me every day. In addition, the newest member of the family, Kristopher, whose smiles and hugs reminded me what life is really all about after a day at the desk. The greatest acknowledgement however goes to my partner Bradley, for seemingly endless patience, and for keeping family, mind and various homes together, until I found my 'Book of Silence' (Horwood 1991).

Author's declaration

I declare that, except where explicit reference is made to the contribution of others, that this dissertation is the result of my own work and has not been submitted for any other degree at the University of Glasgow or any other institution.

Signature:

Printed name: Rhian Wyn Noble-Jones.

Publications and presentations.

The researcher changed her surname from Davies to Noble-Jones during the period of this study.

Davies, R., 2011. Education needs regarding lymphoedema: the specialists, the generalists and the differences of opinion. [Oral presentation.] In: British Lymphology Society 2011. *Reshaping and Renewing: Innovations in Lymphoedema Assessment and Management*, National Conference, Nottingham, England. October 2011.

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Abbreviations

A Glossary of significant terms appears at the end of the thesis.

AHP	Allied Health Professional
AL	Adaptive Leadership
AR	action research (as approach)
BLS	British Lymphology Society (professional body for LS)
CoP/VCoP	Community of Practice/Virtual Community of Practice
CPD	Continued Professional Development
CWA	Collaborative Writing Applications (e.g. wikis)
DN subgroup	Subgroup of lymphoedema specialists working on resources for district and community nurses
GP subgroup	Subgroup of lymphoedema specialists working on resources for General Practitioners.
HCP	Health Care Professional
HEI	Higher Education Institution e.g. university
KN	Knowledge Network an information hub provided NES
IT	Information Technology
LS	Lymphoedema Specialist (nurse/therapist)
LSN	Lymphoedema Support Network (patient support group)
LS subgroup	Subgroup of lymphoedema specialists working on resources for lymphoedema specialists
LTC	Long Term Condition
NES	NHS Education for Scotland
P1...P31, R	In Phase 2 of the study participants are numbered P1 - P31 and the Researcher is coded as R.
RD	Research Diary
SL/SLII	Situational Leadership
SLPN	Scottish Lymphoedema Practitioners' Network
SMASAC	Scottish Medical and Scientific Advisory Committee

1 INTRODUCTION TO STUDY AS A WHOLE

At a time when long term conditions (LTC) account for up to 80% of GP consultations and resource pressures affect all areas of health care, changes to management approaches are essential for sustainability of the health service (Scottish Government 2015). The LTC of lymphoedema remains largely unrecognised and poorly managed outside of specialist lymphoedema services (Lam, Wallace, Burbidge et al 2006; Barlow, Dixey, Todd et al 2014; Finnane, Janda, Hayes 2015). Moreover, nurses and Allied Health Professionals (AHP) at specialist lymphoedema services report late and inappropriate referrals, and struggle to fulfil their educational role with Health Care Professionals (HCPs) in the acute and community sector (British Lymphology Society 2015).

A number of key background issues are important to understanding the rationale behind this study, these are:

- difficulties in establishing reliable prevalence figures for lymphoedema,
- the benefits of early identification and management of lymphoedema,
- patients' perceptions of a lack of lymphoedema-related knowledge amongst HCPs, and
- political factors affecting the educational need of HCP.

These are now discussed, followed by a description of the wider context of relevant UK and international developments.

1.1 Background

1.1.1 Prevalence of lymphoedema

Lymphoedema is a failure of the lymphatic system to drain excess fluid and substances from the interstitial spaces resulting in localised oedema (swelling). Currently an incurable condition, lymphoedema management focuses on controlling symptoms and preventing disease progression and complications, including chronic swelling, discomfort, pain, impaired physical function, recurrent infections, disfiguring skin changes and altered body image (Morgan, Moody, Franks, et al 2005; Towers, Carnevale, Baker 2008; Finnane et al 2015).

Symptoms vary, depending on affected lymphatics, from a mildly swollen hand to grossly enlarged legs and genitalia, or head and neck. These affect daily function and psychosocial status to differing degrees (International Society of Lymphology 2003; Ridner 2009). Lymphoedema may be primary, where the lymphatics themselves function inadequately, or it may be secondary to cancer or other causes. The latter includes chronic oedema defined as being swelling which has been present for over 3 months.

Establishing the prevalence of lymphoedema is problematic because of the lack of a definitive diagnostic description and test. In practice, once reversible pathological causes for chronic oedema have been excluded (e.g. cardiac or renal pathology) accurate differential diagnosis is not routinely sought, since management is similar.

Internationally, most studies have been limited to specific patient groups (e.g. breast-cancer-related only) or have had methodological limitations (Williams, Franks, Moffatt 2005). In the UK, reported prevalence figures vary from 0.84/1000 of general population in Greater Glasgow (Sneddon, Pearson, Franks 2008); 1.33/1000 increasing to 5.4/1000 in those aged >65 years in South-West London (Moffatt, Franks, Doherty et al 2003); to 3.99/1,000 in Derbyshire (Moffatt 2014). The authors of these studies all concluded that their rates were likely to be an underestimation based on the problems experienced in identifying patients through other HCPs and the difference between known figures for prevalence of breast-cancer-related lymphoedema and the number actually identified. This conclusion is supported by an unpublished audit conducted by the Scottish Lymphoedema Practitioners' Network (SLPN) in 2014. The number of new referrals to services in Scotland in the 2013-2014 was 1,984; with 5,674 listed as existing patients. Given the incurable, non-fatal nature of lymphoedema, case-loads tend to accumulate, this annual referral rate would seem to signify a higher prevalence than indicated in an overall population for Scotland of 5,168,500 (Scottish Government 2010a). Further, the number would be expected to increase over the next two decades due to an increase in population (General Register Office for Scotland 2009), and relative number of people over the 65 years in whom the prevalence rate was significantly higher (Moffatt et al 2003).

1.1.2 Benefits of early identification and treatment

The physiology of lymphoedema is only beginning to be understood (Mortimer and Rockson 2014). Late referral often means that tissue damage has progressed to an irreversible state, causing avoidable complications, unnecessary suffering, and increased burden on health and social services (Towers et al 2008; Todd, Harding, and Green 2010). Earlier recognition may result by raising awareness through education. Research with breast cancer patients at risk of lymphoedema indicates that early identification (Stout Gerich, Pfalzer, McGarvey et al 2008), physiotherapy (Lacomba, Sanchez, Goni et al 2010) and education (Fu, Axelrod, Haber 2008) may prevent or reduce symptoms and thereby the cost of treatment (Brayton, Hirsch, O'Brien, et al 2014); and the source and timing of patient information may be significant (Sherman and Koelmeyer 2011).

1.1.3 Patient reported lack of knowledge in health professionals.

Despite the increasing use of the internet, HCPs remain an important source of information about lymphoedema (Ridner 2006). It is important therefore that the educational needs of all HCPs likely to come into contact with patients at risk of lymphoedema are addressed, as well as the needs of the lymphoedema specialist practitioners who act as a resource for generalists. It should be noted that the GP may not be the first HCP to whom a patient would present signs or symptoms of lymphoedema. Presentation may be, for example, to an outpatient department physiotherapist treating shoulder stiffness some years after breast cancer treatment, a podiatrist managing foot problems, or a community nurse managing a leg ulcer. However, patients have reported lack of awareness and knowledge of the condition among GPs and other HCP, resulting in delayed or inappropriate advice and care, indicating an educational need in generalist HCP (Lam et al 2006; Bulley 2007; Sneddon et al 2008).

1.1.4 Contemporary best practice in lymphoedema management

When lymphoedema is identified in its early stages, management might only comprise of educating patients in self-management (self-massage, appropriate exercise, and skin care to reduce risk of damage or infection), but it often includes prescribing a compression garment to wear daily on the affected body

part. However some patients, particularly those who have experienced a delay in diagnosis, may need an initial intensive phase of treatment from a trained therapist/nurse. The intensive phase is known as Complex Decongestive Therapy (CDT) or Decongestive Lymphatic Therapy (DLT) and is recommended as the treatment of choice for lymphoedema which has progressed to International Society of Lymphology (ISL) stages 2 and 3 (International Lymphology Society 2003). DLT is the co-ordinated interaction of manual lymphatic drainage, compression bandaging, skin care and exercise, applied by a trained therapist/nurse (CREST 2008). DLT is modified in the presence of complex co-morbidities or in response to patient choice (CREST 2008; Lasinski, Thrift, Squire et al 2012). Recent innovations in management may also be included but require further research before inclusion in best practice guidelines; these include laser treatment, various forms of electrotherapy and kinesiotaping (Oremus, Dayes, Walker et al 2012) and surgical techniques (Cormier, Rourke, Crosby et al 2012; International Lymphoedema Framework 2012).

1.1.5 Factors affecting the need for education in the community.

A core element in current management of lymphoedema is that sufferers often need to wear specifically designed compression garments. In the years leading up to the commencement of this doctoral study, lymphoedema compression garments had become available on community prescription (Hopkins 2007). Previously, these garments had been provided exclusively through specialist clinics and surgical appliance departments where staff would have specific training. The consensus document *Best practice for the management of lymphoedema* (Lymphoedema Framework 2006) includes a chapter on selecting and fitting compression hosiery, and basic awareness-raising articles have been published (Davies 2007; Linnitt and Davies 2007). There have been no studies that specifically explored the prescribers' perspective of their educational need for safely prescribing these garments, nor whether prescribers were aware of the existence of the best practice document. The compression garments were deemed by the Prescribing Authority (NHS Business Services Authority 2011) to be sufficiently different from the hosiery previously available on Drug Tariff to warrant a separate category in the listings. However for the prescribing HCP,

inexperienced in lymphoedema, there is no clarity on what the difference might be or any recommendation on the training required.

1.2 UK and international service developments.

A national strategy for the management of lymphoedema has been adopted in Northern Ireland (CREST 2008) and Wales (Welsh Assembly Government 2009) but no such strategy exists in Scotland. In 2009 an expert group was formed to look at the relevance and appropriateness of such a document in Scotland. Established by Breakthrough Breast Cancer, the group reviewed the results of an unpublished national survey they had undertaken of breast cancer sufferers and a published Macmillan Cancer Research funded study of the views of lymphoedema specialists (LS) and patients (Sneddon et al 2008). Both of these studies highlighted unmet patient needs and ad hoc service provision.

Increasing HCP awareness and knowledge of lymphoedema remains one of the main aims of both the professional body for LS in the UK, British Lymphology Society (BLS), and the national patient support group, Lymphoedema Support Network (LSN). In 2010 pressure from the BLS, LSN, Scottish Lymphoedema Practitioners' Network (SLPN), Macmillan Cancer Support, and Breakthrough Breast Cancer prompted NHS Education for Scotland (NES) to support a study to explore the nature of HCP educational needs regarding lymphoedema. Phase 1 of this doctoral study emerged from the opportunity to undertake this work. It was anticipated that knowledge gained from this study could inform a national plan for lymphoedema management. It could also inform recent international interest in setting minimum standards for lymphoedema education. One of the first activities of the Education Forum of the International Lymphoedema Framework (formed 2010) was an international scoping exercise to establish the lymphoedema-related content in undergraduate curricula for HCP (International Lymphoedema Framework 2010).

As Phase 1 progressed it became clear that more profound questions could be asked about how an educational need of HCP might be met and what could be learnt from engaging with the process of addressing those needs. Further

explanation of the transition from Phase 1 into Phase 2 of the study is explained in Chapter 8.

Contemporary to this study, in 2012, Macmillan Cancer Support funded a two year Lymphoedema Project. The Project funding paid for a full time Lymphoedema Project Manager whose primary remit was to “devise a national plan to inform and advise NHS boards on best practice service provision of lymphoedema” (SLPN minutes 06.03.2012). The Project aimed to meet the ambitions of the Scottish Government’s quality strategy in relation to access to and continuity of care (Scottish Government 2010b) and education (NHS Education for Scotland 2011). In relation to the management of lymphoedema, the issues to be addressed by the Project were identification of those at risk and risk reduction; standardised referral mechanisms and access to services; recommended data capture and audit; anticipatory care planning; appropriate levels of care and support; quantifiable outcome measures; accessibility to education and training for staff at all levels; and signposting to best practice to encourage effective and timely lymphoedema care. The Project Manager would work with representatives of Scottish Government and NES, University of Glasgow Lymphoedema Education Team, Breakthrough Breast Cancer, representatives from health boards, clinicians and service users in pursuit of these aims.

Although not formally linked to the Macmillan Lymphoedema Project for Scotland, Phase 1 of this doctoral study was recognised as being relevant to its educational aims, with Phase 2 acknowledged as having the potential to fulfil some of its educational ambition.

Concurrently, in June 2012, the Scottish Medical and Scientific Advisory Committee (SMASAC) to the Scottish Government convened a short life working group with a view to producing national recommendations on the treatment of people with, or at risk of, lymphoedema. Initially this was independent of the Macmillan Lymphoedema Project, but the organisations collaborated to publish recommendations for the Scottish Government Health and Social Care Directorates (SGHSCD), territorial Health Boards, NES and Healthcare Improvement Scotland (Scottish Government 2013a). Some recommendations focused on meeting educational, training and research needs which incorporated

findings from Phase 1 of this study (Davies 2012; Davies, Fitzpatrick, O'Neill et al 2012).

In addition to these lymphoedema focused activities, there were two key organisational strategies that were particularly relevant to the context of Phase 2. These were the Scottish Government second eHealth Strategy 2011-2017 (Scottish Government 2011a) and the adoption of an Asset Based approach to management (NHS Health Scotland 2011).

One of the main tenets of the Government eHealth Strategy was to make patient care safer and more effective by making the right information available at the right time to health and social care professionals (Scottish Government 2011a). The strategy highlighted the role that information technology needed to play in new models of health care delivery. It gave, as an example, the number of people in Scotland who live with one or more LTC (2 million) and that their care took up to 80% of GP consultations. It also highlighted the predicted increase in the proportion of older people in the population who were more likely to be living with multiple LTCs (Scottish Government 2011a). Allied to this strategy was the Framework for Efficiency and Productivity which emphasised the economic argument for reducing variation in practice (Scottish Government 2011b, p6). An educational initiative to reduce variance in practice was therefore timely.

Changes to the background management approach at the time were also significant to the context of Phase 2 of this study. In the years leading up to commencement of the second phase, numerous approaches to quality improvement models had been tried within the UK NHS, with poor evidence of success, particularly in relation to cost effectiveness, arguably the most pressing issue. A review of quality improvement models in 2009 focussed on 5 popular models of the time: Total Quality Management (TQM)/Continuous Quality Improvement (CQI), Business Process Reengineering (BPR), rapid cycle change, Lean Management, and Six Sigma (Powell, Rushmer and Davies 2009). This found that the evidence in terms of direct causality of the approach on improving health outcomes was limited and came largely from case studies. Powell et al (2009) conclude that whilst methodological differences in the way models were

evaluated made comparison difficult no one particular model was better than any other. There were however common factors which were more likely to lead to success which included:

...substantial investment in training and development; and the availability of robust and timely data through supported IT systems.

Powell, Rushmer and Davies (2009; p7)

Against this background, in Scotland the Chief Medical Officer announced an intention to use an *asset based approach* to improve healthcare (Scottish Government 2010c). The key feature of this approach was a focus on the factors that create health rather than deficits. A briefing paper in the following year described a key message of the approach:

...mobilising the skills and knowledge of individuals and the connections and resources within communities and organisations, rather than focusing on problems and deficits. The approach aims to empower individuals, enabling them to rely less on public services.

NHS Health Scotland (2011; p1).

The ‘new thinking’ in Scotland of an asset based approach has been explicitly linked to underlying funding cuts (McLean 2011). The asset based approach for improved health within the community relies on building a Sense of Coherence (SOC) in the individuals (the public); for this a patient needs to be well informed about their condition and “believe that the resources to cope are available” (NHS Health Scotland 2011, p5). In a critical review of the asset based approach Friedli (2013) argued that an encouragement to focus on peoples’ assets rather than their needs or deficits precluded a debate about inequalities of power and competing interests in wider society. She was particularly critical of what she described as an almost evangelical adoption of the approach in Scotland where health inequalities had increased at an even steeper rate than the statistically poorer cities of Liverpool and Manchester.

Early proponents of asset based management criticised the predominating focus of researchers and caring professions on needs, deficits and problems in communities (Kretzmann and McKnight 1993). They claimed such an approach was driving an

intensive service environment rather than encouraging people and communities to help themselves. Their proposed alternative was to begin with a clear commitment to discovering a community's capacities and assets.

In relation to lymphoedema management in Scotland, a confirmation of educational need in Phase 1 would mean that the conditions for enabling self-management were lacking. The information and support patients would receive about their condition would be inconsistent across health care providers due to deficits in knowledge and lack of appropriate onward referral. In such a context development of learning resources which could be accessed in a timely manner by HCPs (and equally accessible to patients) would ultimately be consistent with the asset based approach.

In an international review of asset based approaches in relation to health, Morgan, Davies and Ziglio (2010) grouped relevant assets into three levels: Individual, Community and Organisational. Individual level is taken as relating to a member of the public, a patient or a community member. In such a model the health service, its staff and their skills and knowledge become assets which a patient might use in conjunction with other public services (NHS Health Scotland 2011).

Relating these levels to the HCP at work, rather than the patient, allows consideration of assets at their disposal and within their sphere of influence, in order to ultimately improve the assets available to patients:

- Individual - the personal assets of the HCP (e.g. resilience, commitment to learning, self-esteem and sense of purpose) and the professional assets of their role/position (power to influence, skills and knowledge, time and equipment)
- Community - the tangible and intangible assets of the professional network within which they practice (e.g. SLPN)
- Organisational - the wider assets of the NHS and third sector in health (e.g. governance structures).

The background context of Phase 2 might therefore be summarised as one in which tight fiscal constraints made any new tangible resources unlikely and

therefore any progress or development was only likely to be made by creative use of existing assets at the three levels described by Morgan et al (2010). In addition, the work of the Macmillan Lymphoedema Project for Scotland, the commencement of work by the SMASAC short-life working group, and the ambitions of the NHS Scotland eHealth Strategy (Scottish Government 2011a), made a project to develop lymphoedema-related online learning resources timely.

1.3 The Scottish Lymphoedema Practitioners' Network

The Scottish Lymphoedema Practitioners' Network (SLPN) is a group of registered HCPs providing services to NHS Scotland for the management of lymphoedema and chronic oedema. The Network has no dedicated funding and membership is on a voluntary basis.

Its committee consists of a core membership made up of one LS per health board. The SLPN meets 3 times per year, attendance by members relying on the discretion of local managers. At these meetings service provision issues are discussed and case studies are shared as a means of peer learning. A teacher from the University of Glasgow also attends with the aim of informing members of changes in education or research in the field. Core members cascade proceedings to non-attending members through written minutes and, for larger areas, ad-hoc regional meetings.

During the period of this study meetings were usually attended by 8 - 14 core members, and the university teacher was the researcher conducting this doctoral study.

2 LITERATURE REVIEW FOR PHASE 1

2.1 Introduction

This literature review pertains to Phase 1 and was contemporary to the literature at the time (up to 2010); further literature reviews were conducted for Phase 2 and are reported in chapter 9 then expanded intermittently through the study. The review at this stage aimed to find studies investigating the educational or training need of HCPs regarding lymphoedema, or cases of educational need identified from clinical impact.

2.2 Literature search strategy

The terms educational need and learning need were key to the literature search. The working definitions used were that educational assumed provision of some sort e.g. from a teacher or resource and may be directed at many; whereas learning need was assumed to be a personal need that resources might address. Since there is considerable overlap in common use both were used, for ease educational need will be used in relation to findings of the literature review. Individual systematic searches were conducted of electronic database MEDLINE (2005-2010), CINAHL (2005-2010) and the Cochrane Library (2005-2010). Using * truncation facility, the key search words were: lymph*, chronic oedema or chronic edema, education*, education* need*, learning need*. Only papers in English language were reviewed.

Hand searches were also conducted of specialised lymphoedema and related textbooks; journals; websites and discussion forums; and electronic databases of unpublished reports and PhD theses. In addition private correspondence and scoping conversations with HCPs and educators in regional meetings and national conferences provided perspective and context.

Seminal studies from earlier periods were included where they provided context for more recent research.

2.3 Findings of literature search

Most of the literature published about lymphoedema-related educational need have focussed on the patients' rather than the professionals' knowledge (Bosompra, Ashikaga, O'Brien et al 2002; Radina, Armer, Culbertson, Dusold 2004; Ridner 2006). Only 3 studies were identified that related to the need of HCPs, one was based on practitioners in Australia and the others were based on UK practitioners. The literature for the LS and for generalist HCP is now reviewed.

2.3.1 Lymphoedema specialists

For the purposes of this study the term 'lymphoedema specialist'(LS) includes lymphoedema specialists and advanced practitioners, lymphoedema practitioners, and lymphoedema key-workers whether registered as nurses or AHP as defined in Appendix 1, based on Sneddon (2007). 'Key-worker' is a term similar to 'link-worker' in other specialities. It is sometimes used within a hub-and-spoke model of service provision and refers to nurses or AHPs who have undertaken post-registration training in the management of mild or moderate lymphoedema. A key-worker may refer a patient to a specialist service if the patients' condition deteriorates, or receive patients from the specialist service as a patient's condition improves (Green 2010).

Research into the educational need of professionals specialising in lymphoedema care is limited. A study in Australia reported that few LS respondents felt they had received adequate training from their professional body (Langbecker, Hayes, Newman, et al 2008).

Within the UK a national framework for education was published in 2001 (British Lymphology Society 2001) and a table explicitly linking job title/role description to knowledge and skills for lymphoedema professionals was later developed (Sneddon 2007). There are some educational opportunities that would satisfy such a framework through a limited number of UK Higher Education Institutions (HEIs) and other education providers but the job titles itemised in appendix 1 are not yet universally accepted at a managerial or policy level.

In a subsequent study, Sneddon et al (2008) used postal questionnaires and focus groups with LS across Scotland. They found that some respondents often needed to respond to complex needs for which they were not prepared (*ibid*). Seventy-five of 95 respondents, (79%) reported a perceived need for further learning and updating of skills, but the study did not specify the nature of those needs. The study established that issues of funding and being released from work presented for some of the respondents in addressing learning need. Despite using a mixed method approach, the authors did not explore either the relevance of the content of existing education, or whether changing the method of teaching by making greater use of technology for remote learning, might address unmet need.

2.3.2 Generalist Health Care Professionals (HCP).

Only one study has specifically investigated the educational needs of generalist HCP. A multi-method study based in a single London Primary Care Trust explored the educational needs of community nurses caring for patients with lymphoedema (Morgan et al 2005). The study used focus groups based around discussions of case scenarios followed by a structured questionnaire survey of the same nurses. The questionnaires required personal responses about the nurses' current knowledge and skill regarding lymphoedema care. The data were used to develop a three day in-service course and a degree level module. Long-term evaluation of this education provision was not published and no generalised recommendations were made. At the time of this initial literature search, (2010), no educational needs studies had been published for areas outside of North London or with other health professions in the UK e.g. physiotherapists.

Most current provision is based on the perception of local specialist service providers of generalists' needs (e.g. Green 2010; Todd, Key, Rice et al 2008). The specialists' perception of need may be influenced by their experiences of patients referred to their service who may have avoidable complications, or for whom they have concerns about continuity of best practice after discharge from their service. However, a limitation of tailoring response, based only on specialists' perceptions of generalists' educational need, is a potential lack of recognition of the context in which generalists operate.

Following an education audit, Todd et al (2008) reported an interest and demand for education in lymphoedema management amongst community nurses in Scotland, but found that attendance at sessions was disappointing. The reasons given for this were competing clinical demands and staff shortages. Given the contemporary climate of increasing austerity measures in all sectors of health care, exploration into alternative methods of education delivery, including appropriate use of the latest technology, seemed warranted.

2.4 Summary of the literature review

Research focussing on the lymphoedema-related educational need of both specialist and generalist HCP is limited.

In relation to specialists, whilst a framework for post-registration education exists, it was not integrated into wider health care policy and access to existing education was limited by funding. An exploration of the nature LS educational needs and how these might be met is warranted.

Similarly research into the lymphoedema-related educational needs of generalist HCPs such as community nurses, GPs and AHPs is very limited. No studies have tried to reconcile the reported perception of specialists with the limited findings directly from generalists themselves. Therefore a study addressing this gap in research could be informative and add to the existing knowledge base.

3 RESEARCH QUESTION AND METHODOLOGY FOR PHASE 1

3.1 The research question and design

The research question addressed in this Phase was:

What are the educational needs of health care professionals (HCP) in Scotland regarding the identification and management of lymphoedema?

The specific objectives were to determine:

1. the educational needs of HCP, whether generalist or specialist, in relation to lymphoedema from the perspective of lymphoedema specialist practitioners,
2. the educational needs of generalist HCP in relation to lymphoedema from their own perspective, and
3. the best mix of educational approaches that would meet the identified needs of both lymphoedema specialist practitioners and generalist HCP.

3.2 Methodology

One of the main factors affecting the study design was the need to take account of the diversity of lymphoedema service provision within Scotland. This ranged from full services for all patients, adults and children, cancer-related and non-cancer-related lymphoedema being provided by multiple specialists in one health board, to other boards where services are limited to one part-time specialist providing adult cancer-related only, or even adult breast-cancer-related only. The accessibility of specialist services was therefore likely to affect the educational needs of HCPs. It was important to try to capture as wide a geographical spread as possible to assess the impact of this variation, rather than taking one or two health boards as sample populations.

The study design was also influenced by two further considerations. First, the recognition that learning need is a subjective personal phenomenon, each

individual having a slightly different need relating to lymphoedema management depending upon role, profession, experience and workplace. Second, providers of health care education must offer learning opportunities to suit the maximum number of HCPs.

3.2.1 The philosophical approach

In this phase of the study the post-positivist research paradigm of critical realism was appropriate (Bhaskar 1989; Benton 2004). In this paradigm, distinction is made between independently-existing real beings and processes, seen as intransitive objects of scientific knowledge, and socio-culturally produced concepts and knowledge claims, which are transitive. There is recognition that in assessing education need, observation is fallible, that stand-alone data collection methods have weaknesses, and that 'truths' may need revising, given new data. The reality is constructed from observation and perception, both being prone to subjective interpretation. Triangulation is used across methods to find a reality that is as authentic as possible for a given time and situation (Trochim 2006). Polarising research methods into quantitative and qualitative, claiming a stance of fundamentally different paradigms may not be helpful in health care or education research, and evaluation of policy changes and interventions in health care are increasingly studied with a critical realist approach in recognition of the contextual complexity (Pawson and Tilley 1997; Pawson, Greenhalgh, Harvey et al 2005).

Given the research questions and the philosophical approach, a number of data collection methods were considered. Broadly, approaches to the investigation of education need might be divided into ethnographic observation of behaviour on the one hand, and on the other hand, direct questioning of the participants of study, via survey or interview. Proxies could be people influenced by the actions of the participants e.g. patients or the specialists receiving referrals from generalist HCPs. Both observation and direct enquiry approaches have strengths and weaknesses. The main problem with observing behaviour as an indicator of education need is that many factors other than education (or knowledge) affect intention to act, as described in a multitude of theories on motivation e.g. Triandis (1977), Bandura (1991), Ryan and Deci (2000). For this reason, it cannot

be assumed that an anecdotal lack of appropriate referral to lymphoedema services, for example, is attributable only to education need on the part of the HCP. However, directly asking participants about their educational needs also has weakness. The main being the blind spot of not knowing what one could know. No HCP is going to be aware of all developments in all fields. There will therefore always be some interdisciplinary (or health context based) differences in levels of knowledge of contemporary best practice. The use of more than one source of data, if judiciously selected, may address these weaknesses to some extent. During this phase, the methods of data collection were electronic surveys and focus group discussions. The considerations that justify their selection are now discussed.

3.2.2 Electronic survey methods

Resources required to implement electronic surveys include the time and personnel involved in questionnaire construction, piloting, and securing access to an appropriate sample population and coding. In addition factors affecting bias, such as access to computers, self-report and non-response needs consideration.

3.2.2.1 Accessing appropriate samples and reducing bias

A cross-sectional, descriptive survey capturing a snap-shot in time was appropriate to the research question. Reconnaissance discussions with HCP, particularly GPs confirmed that postal questionnaires were often ignored and electronic versions were only noticed if they had timely relevance to practice or linked to managerial drives and targets. Only receiving responses from those with an existing interest in the subject of the research enquiry represents a significant non-response bias (Kennet 2006; Durrant 2009).

One way of introducing a level of targeting whilst reducing researcher bias of the sample is to use normal channels of communication used to cascade organisational information. This method ensures that the study's targeted population has access to the survey, if it can be assumed that each level of the cascade will pass on the information in its entirety. Covering letters, endorsement or championing of the survey at different levels, and ease of completion will all make a difference to response rates (Denscombe 2009).

Non-response can be whole unit non-response or a specific item non-response e.g. if only physiotherapists of higher grades responded to a survey intended to elicit the views of all grades; or a particular question was only answered by the higher grades, the finding could not be reported as representative of the whole population of physiotherapists. Differences between unit and specific item non-response have been found between paper and online surveys (Denscombe 2009).

A Delphi method study, whilst arguably appropriate to achieve a consensus on educational need was unlikely to get the commitment required for repeated rounds of survey from HCP for whom this was not a subject high on their priority list.

3.2.2.2 **Self-reporting**

Self-completed questionnaires require that, not only does the participant need to be able to understand the wording and context of each question and what type of response is expected, but also to respond accurately. Socially desirability of response may also affect responses, and the way the researcher understands the question may be different to the participant's understanding (Kennett 2006). When surveying for educational need a particular problem arises from participants being unaware of their gap in knowledge. Ways of overcoming such blind-spots include asking a question with particular reference to new guidance documentation, which might flag-up a lack of awareness; or triangulating with data from surveys of other participants e.g. patients or services receiving referrals from GPs. However, the views of the service users are equally prone to bias.

3.2.2.3 **Advantage of online over paper questionnaires**

Responder attrition is an issue with questionnaires (Iarossi 2006). An advantage of electronic questionnaires is that they can be designed to accommodate filter questions so that according to a particular response individuals can be navigated automatically to the next relevant question. In addition, questionnaire software can allow simplification of matrices which can guide the participant in the number and type of response e.g. word or number, or by not allowing multiple responses in the same column. The disadvantage is that if a question is poorly worded or set

up there may be little option for the participant to express an alternative answer, unless an open response box is added.

3.2.3 Focus group discussion method

Focus group discussions provide an opportunity to bring together different people with the purpose of discussing a particular issue or focus of attention (Krueger and Casey 2009). The purpose is to facilitate the emergence of differing views, and to explore and understand those differences (Kvale 1996). The philosophy is interpretivist rather than positivist and focus groups are sensitive to social context.

Focus groups can be used where little is known of the subject, or of the experiences of the participants in relation to the subject (Bloor, Frankland, Thomas, et al, 2001). Increased understanding of how a lack of skills and knowledge on lymphoedema affected the work of HCP and what meaning/implication that had for them, and the patient, may be useful. Having differing types of HCPs within a focus group would have the potential to challenge assumptions and explore different views.

3.2.4 Mixed method research and triangulation

In Phase 1 of this study quantitative and qualitative data are used to gain greater completeness and understanding (Creswell 2009; Al-Hamdan and Anthony, 2010) and is consistent with the adopted philosophical approach (section 3.1.2).

Planning to meet the educational needs of large dispersed groups needed a method such as a questionnaire to collect data that could be generalised to certain professional groups or geographical areas. Having identified areas of need these could then be explored in greater depth, for richer understanding of meaning in the work context, using a qualitative method such as a focus group discussion (Krueger and Casey 2009).

There are various types of learning needs assessments, depending upon driver or focus (Grant 2002). This doctoral study was aiming to assess group needs, from an individual rather than organisational perspective. It was designed to compare

views of the LS (normative need) which were based on the actions of the generalists (expressed need), relative to the views expressed by the generalists (felt need).

Based on all these considerations the research design was mixed methods, triangulating data from electronic questionnaire surveys and focus groups.

4 METHODS FOR PHASE 1

4.1 Study design

Phase 1 was based on two distinct but complementary stages utilising both quantitative and qualitative methods.

The first stage comprised two electronic questionnaire surveys, the first of LSs and the second of generalist HCPs, to obtain quantitative data on education need, previous learning, and preferred learning modes.

The second stage comprised two facilitated focus group discussions with a purposive sample of respondents to the questionnaire survey, to obtain qualitative data to gain insight into their expressed views.

No incentives to participate were offered as is consistent with British Educational Research Association (2011) guidelines.

4.2 Study population

The study population was all HCPs employed, or contracted to provide patient care in the NHS in Scotland, but in particular those providing services in the community, oncology or palliative care environments.

4.3 Ethical approval

Approval for Phase 1 as educational research was given by University of Glasgow Medical Faculty Ethics Committee in January 2011 (Appendix 2). Following communication with the Scientific Officer of the Local Research Ethics Committee (LREC) Phase 1 did not require a formal review by the LREC committee.

4.4 Questionnaire surveys

Two separate questionnaires went through the following design and testing process, one for the LS and one for the generalist HCP.

4.4.1 Questionnaires construction and pilot

Questions were derived from the literature and from scoping the views of expert clinicians, academics and other HCPs both within Scotland and the wider UK. Some questions were designed to explore similar aspects from a different perspective so that there was some internal triangulation, enhancing reliability. For example questions 6 and 11 in the generalist HCP questionnaire both addressed specific sub-topics with lymphoedema management (Appendix 3).

Piloting of the questionnaires was conducted with members of each main HCP group outside of Scotland so that the study population was not included, as well as with educationalists and experienced researchers uninvolved in lymphoedema management. Initially the questionnaires were in paper format. The questionnaires were then put into electronic format with changes to clarify the meaning of some questions, thereby improving reliability, and as response to feedback regarding ease of use, and tested again. Several existing electronic survey tools were considered such as BristolOnlineSurvey, Zoomerang and SurveyMonkey. The latter was selected on the basis of ease of use, tools, features offered and clarity of data security processes (Cline 2010). The risk and benefits of monitoring the individual IP addresses (the unique numerical identifier of each computer) of respondents were considered. The risk of multiple entries from the same individual was considered low given the subject matter and minimal benefit to any individual. A benefit of allowing multiple entries from one IP address was that potential respondents sharing a device, such as in a clinic or on a ward, would be able to participate. In addition, not monitoring the IP addresses meant being able to assure respondents that neither their IP address (nor e-mail address) would be held by either the web-host or the researcher, unless they voluntarily gave their e-mail address for the purpose of contact for the subsequent focus group discussions.

Respondents to the pilot questionnaire surveys were asked to give feedback on:

- ease of use (navigation)
- clarity of meaning

- sense of usefulness (i.e. does it make the professional feel like their contribution is worthwhile?)
- any other comment

The final version of the LS questionnaire survey had a maximum of 25 items over 18 screens (Appendix 4). Some respondents would be shown fewer items if the answers to filtering questions were negative. A covering e-mail and the first page of the questionnaire gave an average time for completion. This questionnaire covered both self-identified educational needs and their perceptions of educational needs of other HCPs. For the latter, the LS were asked to complete a comprehensive matrix to indicate up to three subjects of educational need per HCP type e.g. physiotherapist. The potential attrition from lengthiness of survey was mitigated to some extent, by the particular interest of this survey's population in the subject, and that they had been primed by pre-notification e-mails and discussions in face-to-face meetings.

The final version of the questionnaire for the generalist HCP had a maximum of 14 items over 11 screens (Appendix 3). Similarly filter questions meant that some participants were shown fewer items. This survey only included self-identified education needs.

In both final versions of the questionnaires, a mixture of question formats was used dependent on the nature of the question.

Both questionnaires elicited demographic data. However, LS were not asked to identify their health board (geographical region) as, with low numbers in some health boards, this might identify individual respondents threatening anonymity of responses. Therefore Scottish Government definitions of urban/rural (Scottish Government Geographic Information Science and Analysis Team 2010) were used in order to have the potential to identify any specific issues one type of location might have, given sufficient responses.

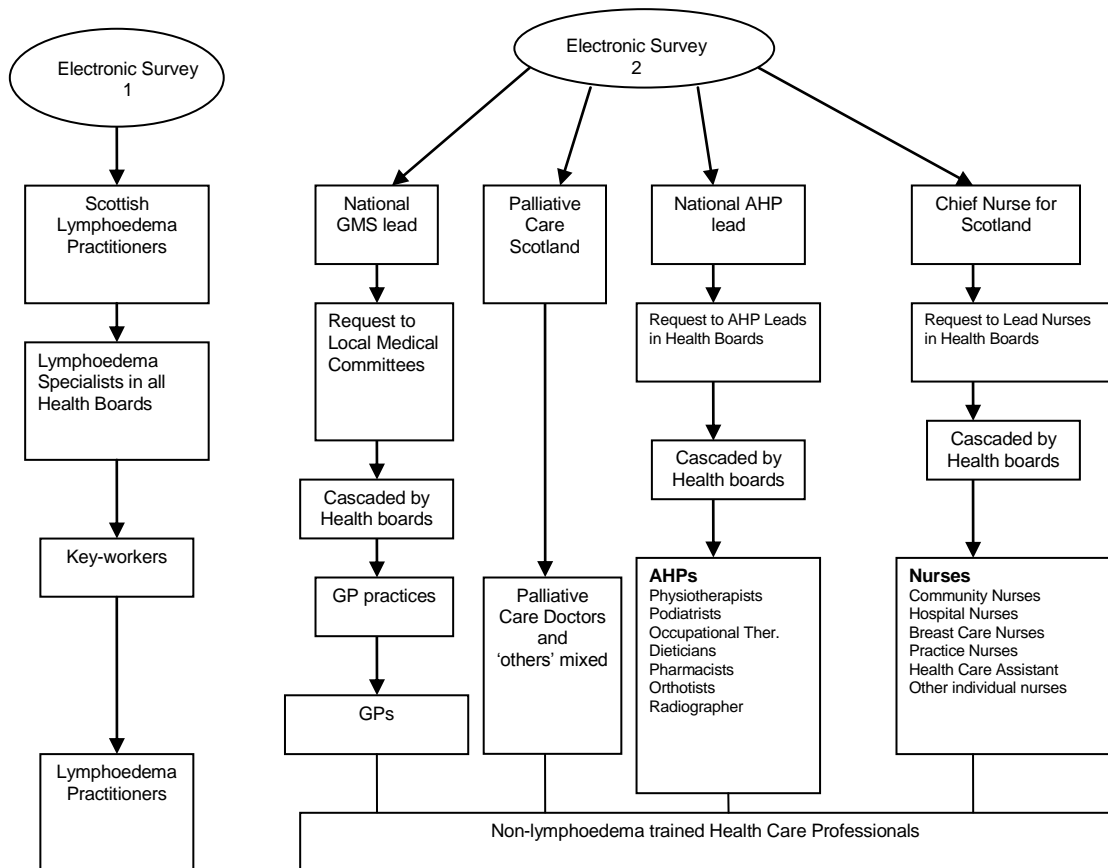
Respondents were able to review and change their answers until the final submission button. As core questions had to be completed to reach the submit button and the software tool allowed each question to be analysed individually,

incomplete questionnaires could be included in the analysis once submitted. The software tool also allowed results to be stratified by named variable such as by profession or health board so where there was sufficient number of respondents this was useful.

4.4.2 Questionnaire survey recruitment strategy

In order to overcome the need for individual e-mail addresses, and associated privacy issues, a cascade design was used to recruit participants for the survey (Figure 4.4-1). Agreement to distribute the generalist HCP questionnaire was sought centrally from the lead of each main professional group; this was given by the office of the Chief Nurse for Scotland, the Allied Health Professional (AHP) lead for Scotland, and the national General Medical Services (GMS) lead to cascade through local GP sub-committees (Local Medical Committees representatives). In addition, in order to capture doctors and other HCP working in hospices, or similar services outside the above routes, a survey web-link was also distributed through the Scottish Partnership for Palliative Care, an umbrella organisation for palliative care services in Scotland. The agreement of the SLPN was given to cascade the LS questionnaire to its members.

Figure 4.4-1 Strategy for distribution of questionnaires



Adapted from Davies (2012)

4.4.3 Questionnaire survey data collection

The questionnaires were e-mailed to the professional leads for cascading at the beginning of February 2011. This was followed by two requests, one mid-month and the other at the end of the month, to re-cascade the e-mail as a reminder.

4.4.4 Questionnaire survey data analysis

The questionnaire data obtained were initially analysed using SurveyMonkey software for overall impression then analysed in more detail using SPSS19 software. As the data were all categorical, descriptive statistics were used. Differences in responses between professional groups were explored using Pearson’s Chi- Squared (χ^2) test of association, with a significance level defined as 0.05, or Fisher’s test as appropriate (Agresti, 1996). The χ^2 test is a difference in two population proportions, Fisher’s being used when 25% of within test figures are <5.

The qualitative data (i.e. free text in comment boxes) were subjected to thematic analysis (Ryan and Bernard 2000) and the interpretations peer reviewed by an academic and an independent researcher (Silverman 2001).

4.4.5 Focus group discussions

Two focus group discussions were held ten weeks after the close of the questionnaire surveys. This allowed sufficient time for initial analysis of questionnaire data to inform the content of the thematic guide for the focus group discussions (Appendix 5).

4.4.6 Focus group recruitment and sampling strategy

A sample of survey respondents, who gave their contact details indicating they were willing to participate further in the study, was purposively selected to achieve the greatest possible representation of professions and health boards. Individually signed consent was gained before the commencement of each focus group discussion. Selection of participants was governed by the principle that members of each group should be fairly homogenous but with enough diversity to allow for the exchange of different ideas and hence discussion (Krueger and Casey 2009).

4.4.7 Focus group data collection and analyses

A template for the focus group discussions was designed by the researcher to facilitate discussion which would give a deeper understanding of the meaning of the educational needs identified in the surveys. The discussions were facilitated by an independent facilitator which allowed the researcher to take field notes and observe interactions. In addition, a short time at the end of each discussion was designated for the researcher to ask any clarifying questions.

After each focus group the facilitator and researcher reflected on their interpretation of the discussion, as per Krueger and Casey (2009), and further field notes were taken (Appendix 6). The focus group discussions were audio-taped and transcribed verbatim by the researcher before analysis to identify themes (Appendix 7), using the field notes as memos to the interpretation.

Thematic analysis by framework method (Ritchie and Lewis 2003) was used by the researcher individually and repeated to assess reliability, with particular note of any outliers of the framework. A process of peer-review was then used to enhance the trustworthiness of the analysis. Another researcher independently carried out thematic analysis on the data and discrepancies were discussed with a third, experienced colleague (Data analysis is further explicated and compared to Phase 2 in section 10.3.5).

4.4.8 Data handling and storage

Data handling within this study complied with contemporary University of Glasgow security policies and guidance (University of Glasgow 2011).

5 RESULTS FROM PHASE 1

This chapter reports the results of the survey of LS, the survey of generalist HCPs and focus group interviews which involved respondents from both groups.

In total 534 HCPs in Scotland responded to the surveys and 14 HCPs participated in the focus group discussions.

5.1 Lymphoedema Specialist survey

5.1.1 Characteristics of the Lymphoedema Specialist respondents

Thirty six of a known total population of fifty-four LS (including key-workers) in Scotland (67%) responded to the questionnaire survey.

Most were nurses or physiotherapists, though one had a medical and two had occupational therapy backgrounds (Table 5.1-1). Around one half of respondents (51%) indicated that 'lymphoedema' was in their job title; 25% had oncology, palliative care or breast care in their job titles; and the remainder had more generalist job titles, including surgeon, community nurse, physiotherapist and occupational therapist. Almost two fifths of respondents (39%) spent at least 40% of their working time as a LS, and almost three quarters (74%) had protected time for their work as a LS.

Table 5.1-1 Characteristics of Lymphoedema Specialist respondents

Characteristic	Number (%) of respondents N=36
Job title	
lymphoedema specialist	13 (36)
lymphoedema key worker	3 (8)
lymphoedema practitioner	2 (6)
lymphoedema advanced practitioner	1 (3)
oncology/palliative care physiotherapist	6 (17)
oncology/palliative care nurse	3 (8)
oncology/palliative care occupational therapist	2 (6)
breast care nurse	3 (8)
community/district nurse	1 (3)
surgeon	
Working time as Lymphoedema Specialist	
80-100%	11 (31)
60-79%	0 (0)
40-59%	3 (8)
20-39%	11 (31)
< 20%	6 (17)
not known	5 (14)
Protected time as Lymphoedema Specialist	
yes, fully protected	20 (56)
yes, partially protected	7 (19)
no, not protected	4 (11)
not known	5 (14)

Almost two thirds of the respondents (64%) had 4 or more years' experience of working as a LS, and a similar proportion (67%) worked in organisations serving a

patient population of 10,000 or more (Table 5.1-2). Just over half of the respondents (53%) practiced only in hospital or hospice care settings, 8% worked only in community or residential care settings, and 29% worked across all these care settings.

Table 5.1-2 Characteristics of work context

Characteristic	Number (%) of respondents N=36
Patient population size of employing organisation	
over 125,000	15 (42)
10,000-125,000	9 (25)
3,000-9,999	4 (11)
less than 3,000 near town	3 (8)
remote	2 (6)
not known	3 (8)
Care settings	
hospital and hospice only	19 (53)
community and residential only	3 (8)
hospital, hospice, community and residential	10 (28)
not known	4 (11)
Works in team with other Lymphoedema Specialists	
yes	23 (64)
no	10 (28)
not known	3 (8)

Respondents with 'lymphoedema' in their job title were no more likely to have longer experience working as a LS, to work in a particular care setting or to work in a team with other LS (Table 5.1-3). However, there were population proportion differences in respondents with 'lymphoedema' in their job title compared to those without. The former were more likely to be employed by an organisation serving a patient population of 10,000 or more (100% *c.f* 44%, $\chi^2(1, N=33) = 13.4, p < .001$), to spend 80% or more of their time working as LS (69%

c.f 0%, $\chi^2(1, N=31) = 15.98$, $p < .001$), and to report that their time to work as a LS was fully protected (100% c.f 31%, $\chi^2(1, N=31) = 15.98$, $p < .001$).

Table 5.1-3 Characteristics of Lymphoedema Specialist respondents with and without lymphoedema in job title

Characteristic	Number (%) of respondents N=36		p* value
	with 'Lymphoedema' in Job title	without 'Lymphoedema' in Job title	
4 or more years experience as lymphoedema specialist	13(81)	10(63)	0.217
works in both acute and community care settings	6(35)	4(27)	0.718
works in organisation with 10,000 or more patients	17(100)	7(44)	<.001
80% or more work time dedicated to lymphoedema	11(69)	0	<.001
have fully protected time for lymphoedema specialist work	15(100)	5(31)	<.001

*Statistical test: Pearson's Chi Square test of association, with α significance level defined as 0.05

5.1.2 Training background of the Lymphoedema Specialist respondents

Training is divided into basic (key-worker level), and advanced (specialist level) (Sneddon 2007). As lymphoedema is a relatively new speciality some respondents would enter training at advanced level based on experiential learning. All but 3 respondents (92%) reported that they had undertaken one or more training courses in lymphoedema: 20 (56%) had both advanced and basic training, 6 (17%) had advanced training only and 7 (19%) had basic training only (Table 5.1-4).

Twenty two of the 27 respondents (81%) who had undertaken basic training reported that this was an HEI accredited course (Table 5.1-4). Of the remainder, all but one respondent reported that the training course was accredited by

another organisation. Eighteen of the 26 respondents (69%) who had undertaken advanced training reported that this was an HEI accredited course (Table 5.1-4). Of the remainder, one respondent reported that the training course was accredited by another organisation whilst the others had attended non-accredited courses.

Table 5.1-4 Training and education characteristics of Lymphoedema Specialist respondents

Characteristic	Number (%) of respondents N=36
Level of training	
none	3 (8)
basic only	7 (19)
advanced only	6 (17)
basic and advanced	20 (56)
Basic training course type and provider	
accredited course of a Higher Education Institution	22 (81)
accredited course of another organisation	4 (15)
non accredited course of another organisation	1 (4)
Advanced training course and provider	
accredited course of a Higher Education Institution	18 (69)
accredited course of another organisation	1 (4)
non accredited course of another organisation	7 (27)

Learning modes varied slightly between basic and advanced courses. On the basic courses: 12 (44%) reported face-to-face learning, 3 (11%) reported mixed methods (blended learning), 8 (30%) reported distance learning, 1 (4%) reported work-place learning with a mentor and 1 (4%) reported self directed learning (Table 5.1-5).

On the advanced courses the learning modes were: 9 (35%) reported face-to-face learning, 11 (42%) reported mix methods, 3 (11%) reported work-place learning with a mentor and 3 (11%) reported self directed learning (Table 5.1-5).

Table 5.1-5 Learning modes in Specialist education

Characteristic	Number (%) of respondents N=36
Basic training learning mode	
face-to-face learning	12 (44)
mixed methods	3 (11)
distance learning	8 (30)
work place with mentor	1 (4)
self directed	1 (4)
not known	2 (7)
Advanced training learning mode	
face-to-face learning	9 (35)
mixed methods	11 (42)
work place with mentor	3 (11)
self directed	3 (11)
Means for identifying learning need	
personal development review	24 (67)
personal reflection	24 (67)
critical incident review	16 (44)
personal curiosity	15 (42)
peer pressure	4 (11)
service benchmarking	4 (11)

The respondents used a number of formal and informal means to identify their learning needs: for 24 (67%) this was their personal development review, 24 (67%) personal reflection, 16 (44%) critical incident review, 15 (42%) personal curiosity, 4 (11%) peer pressure and 4 (11%) service benchmarking (Table 5.1-5).

Almost two-thirds of respondents (64%) reported that their learning needs were completely or mostly met, and the same proportion (64%) reported that they had undertaken lymphoedema training/update in the previous 2 years. Looking at the population proportions, respondents who had completed this training were more likely to report that their training needs had been completely or mostly met (82% *c.f* 42%, $\chi^2(1, N=32)=4.66$, $p=0.03$). No differences were found in the responses on

the extent to which educational needs had been met in relation to size of patient population served by their employer, practice care setting, proportion of work time dedicated to lymphoedema, protected time as a LS, or having 'lymphoedema' in their job title.

The enabler for undertaking the lymphoedema training in the previous 2 years were: for 21 respondents (91%) support from their managers, 17 (74%) study leave, 16 (70%) funding for course fees, 14 (61%) need for qualification, 8 (35%) funding for travel expenses, and 7 (30%) personal reasons (Table 5.1-6).

Table 5.1-6 Reported enablers of the lymphoedema specialist respondents for undertaking lymphoedema training in the previous 2 years

Enabler	Number (%) of respondents N=36
support from manager	21(91)
study leave	17(74)
funding for course fee	16(70)
need for qualification	14(61)
funding for travel expenses	8(35)
personal reason	7(30)

The majority of respondents (70%) were given study leave for 100% of the course (Table 5.1-7). Of the remainder, 1 had study leave for 75% of the course, 2 for 50% of the course, 1 for 30%, 1 was not given any and 2 did not indicate if study leave was given.

Table 5.1-7 Reported study leave for lymphoedema training undertaken in the previous 2 years by the lymphoedema specialist respondents

Proportion of course for which study leave was given	Number (%) of respondents N=36
none	1(4)
30%	1(4)
50%	2(9)
75%	1(4)
100%	16(70)
not known	2(9)

The employer was the main source of funding for course fees; self funding was the main source for travel expenses (Table 5.1-8).

Table 5.1-8 Reported funding for lymphoedema training undertaken in the previous 2 years by the lymphoedema specialist respondents

Funding source	Course fee number (%) of respondents N=36	Travel expenses number (%) of respondents N=36
employer + external + self	2 (9)	0
employer + external	2 (9)	0
employer + self	0	1 (4)
employer only	10(43)	3(13)
external only	6(26)	3(13)
self only	1 (4)	10(43)
other	1 (4)	1 (4)
not applicable (i.e. no attached cost)	1 (4)	4 (17)
not known	0	1 (4)

5.1.3 Future training priorities of the Lymphoedema Specialist respondents

Just over one third of respondents (36%) identified a training need for the future in relation to latest innovations (Table 5.1-9). One quarter of respondents (25%) identified future training needs in relation to manual lymphatic drainage and differential diagnosis. Between one-tenth and one-fifth identified future training needs in relation to service development and management; teaching/supporting other health professionals, genital oedema; oedema in advanced disease; related dermatology issues; supporting self management; and wound/ulcer care.

Less than one-tenth of respondents identified future training needs in relation to measuring and fitting compression garments; application of kinesiotape; exercise prescription; lymphoedema management in acute oncology; research skills; teaching patients/carers lymphatic drainage massage; head and neck oedema; measuring and fitting alternative forms of compression; supporting patients undergoing liposuction; and use of laser.

Table 5.1-9 Reported future training needs by lymphoedema specialist respondents

Focus of training (N=36)	Number (%) of respondents
Latest innovations	13 (36)
Manual lymphatic drainage	9 (25)
Differential diagnosis	9 (25)
Wound/ulcer care	7 (19)
Supporting self management	7 (19)
Related dermatology issues	6 (17)
Oedema in advanced disease	5 (14)
Genital oedema	5 (14)
Teaching other health professionals lymphoedema management skills	5 (14)
Service development and management	4 (11)
Measuring and fitting compression garments	3 (8)
Application of kinesiotape	2 (6)
Exercise prescription	2 (6)
Lymphoedema management in acute oncology	2 (6)
Research skills	2 (6)
Teaching patients/carers lymphatic drainage massage	2 (6)
Head and neck oedema	2 (6)
Measuring and fitting alternative forms of compression	1 (3)
Supporting patients undergoing liposuction	1 (3)
Use of laser	1 (3)

More than two-thirds of respondents saw potential for their future lymphoedema education to be enhanced by teaching podcasts; web-based problem solving; and DVD Master Classes. (Table 5.1-10) Between one half and two-thirds saw similar potential in web-based self assessment, live web access to a tutor; web-based student discussion forum, DVD modular assessment by an accredited organisation, DVD modular self-assessment and web-based assessment by an accredited organisation. One third of respondents perceived this potential in Telehealth Master Classes.

Table 5.1-10 Reported perceptions of the lymphoedema specialist respondents of the potential for technology to enhance lymphoedema education

Type of technology	Number (%) of respondents N=36
teaching podcasts	25 (69)
web-based problem solving	24 (67)
DVD Master Class	24 (67)
web-based self assessment	22 (61)
live web access to tutor	21 (58)
web-based student discussion forum	21 (58)
DVD modular assessment by accredited organisation	20 (56)
DVD modular self assessment	19 (53)
web-based assessment by accredited organisation	19 (53)
Telehealth Master Class	12 (33)

5.1.4 Education needs of generalist health care professionals as perceived by the Lymphoedema Specialist respondents

Twenty-eight of the LS (78%) perceived that other HCPs had educational needs in relation to lymphoedema. For the purposes of this thesis, the acute/specialist doctors and nurses group includes hospital doctors and nurses, hospice doctors and nurses, and breast care nurses. The community doctors and nurses group includes GPs, community/district nurses and practice nurses. The AHP group includes physiotherapists, podiatrists, occupational therapists, dieticians, orthotists, radiographers and pharmacists. Where there are significant within-group differences these are highlighted.

In relation to acute/specialist doctors and nurses, more than half the LS perceived educational needs pertaining to lymphoedema in acute oncology (53%), current management (61%), identification of patients at risk of developing lymphoedema (67%) and skin care (64%)(Table 5.1-11). In addition over a third identified a need for differential diagnosis (42%) and management of oedema in advanced disease (36%).

In relation to community doctors and nurses, more than half of the LS identified educational needs in relation to current lymphoedema management (64%), differential diagnosis (58%), identification of patients at risk of lymphoedema (61%), wound/ulcer care (69%) and skin care (53%). In addition, over a third identified assessment of chronic oedema (39%) and measuring for compression garments (33%) as educational needs. However there were differences within this group; more than two-thirds of specialists identified wound/ulcer care as a particular need of community/district nurses rather than GPs (64% *c.f.* 8%, $\chi^2(1,36) = 24.08$, $p < .001$).

In relation to allied health professionals, over a third of LS identified educational needs for AHPs in relation to skin care (58%), exercise (50%), identifying patients at risk of lymphoedema (47%) and current management (44%). Within-group analysis shows that the specialists identified the main education need of physiotherapists as regarding exercise (50%) and the main need of podiatrists as skin care to reduce risk of cellulitis (50%).

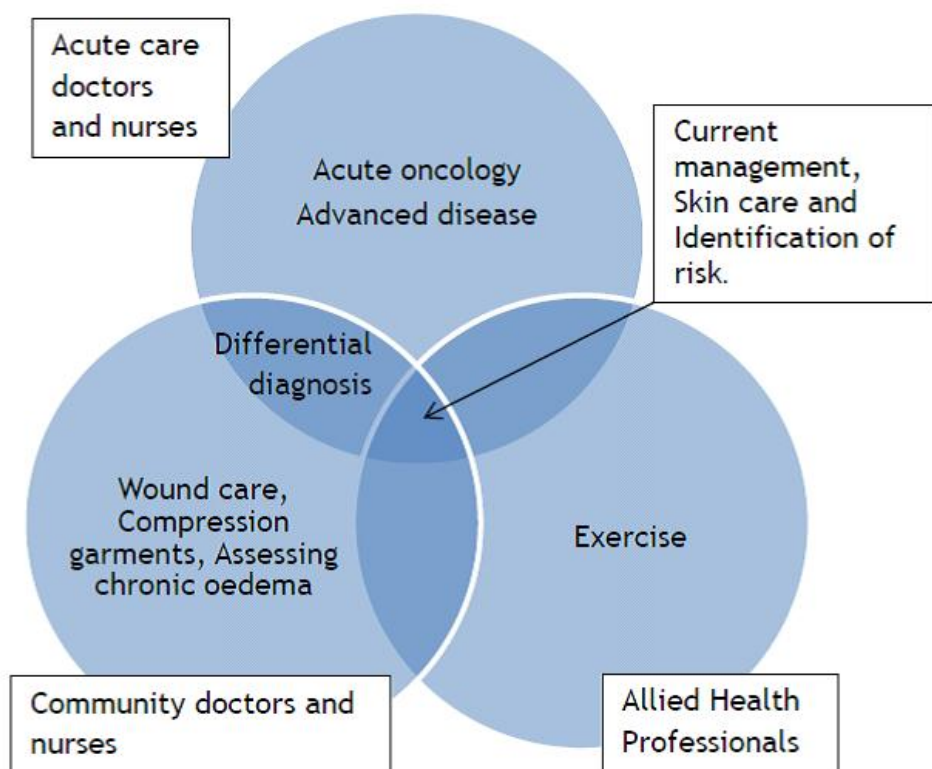
Table 5.1-11 Reported perceptions of the lymphoedema specialist respondents on the education needs of other health care professionals

Focus of lymphoedema educational need	Number (%) of respondents who identified this need for each group of HCP (N=36)		
	Acute/ specialist doctors and nurses	Community doctors and nurses	Allied health professionals
Current management	22 (61)	23 (64)	16 (44)
Differential diagnosis	15 (42)	21 (58)	4 (11)
Exercise	9 (25)	7 (19)	18 (50)
Head and Neck	3 (8)	6 (17)	3 (8)
Identification of those at risk	24 (67)	22 (61)	17 (47)
Acute oncology	19 (53)	7 (19)	6 (17)
Advanced disease	13 (36)	7 (19)	4 (11)
Compression garments	7 (19)	12 (33)	3 (8)
Pneumatic pumps	0	1 (3)	2 (6)
Teach self massage	8 (22)	7 (19)	4 (11)
Wound/ulcer care	10 (28)	25 (69)	4 (11)
Skin care	23 (64)	19 (53)	21(58)
Bandaging for lymphoedema	6 (17)	11(31)	1 (3)
Bandaging in advanced disease	13 (36)	13(36)	4(11)
Assessment of chronic oedema	10 (28)	14 (39)	10 (28)

Thus, taking subjects identified by over a third of LS respondents, current management, skin care to reduce cellulitis risk, and identifying patients at risk were perceived educational needs for all three professional groups (see Figure 5.1-1 below). Differential diagnosis of lymphoedema was identified as an

educational need for doctors and nurses in both hospital and community care settings. Further educational need was identified for community doctors and nurses in relation to compression garments, assessment of chronic oedema and wound/ulcer care. Educational need for acute/specialist doctors and nurses were identified in relation to lymphoedema in acute oncology and lymphoedema in advanced disease. Finally, in addition to the three common subjects, education in relation to exercise was identified for AHPs (Figure 5.1-1).

Figure 5.1-1 Relationship between the lymphoedema specialists' perceived education needs of different groups of generalist health care professionals in relation to health care setting.



5.2 Generalist Health Care Professional survey

Four hundred and ninety-eight generalist HCP responded to the online survey: 218 community doctors and nurses (44%), 71 acute/specialist doctors and nurses (14%) and 209 AHPs (42%)(Table 5.2-1). As the overall number of professionals sent the survey is not known due to the cascade system used, it is not possible to describe the response rate to this survey.

5.2.1 Characteristics of generalist HCP survey respondents

In the achieved sample of community doctor and nurse there were 116 GPs (23% of total respondents), 71 community/district nurses (14%) but only 8 practice nurses (1.6%). It also included 12 cancer/palliative care nurses and one hospice/palliative care doctor who described their work as community-based. The remainder were specialist nurses, psychiatric nurses and other nurses described as working within the community (Table 5.2-1).

In the achieved sample of acute/specialist doctors and nurses there were 29 who identified themselves as hospital-based nurses while another 11 described a hospital as the base for most of their role. Other respondent numbers are low but include breast care nurses, hospital based cancer/palliative care nurses and hospital/hospice doctors. The survey was not targeted at social and health care assistants as lymphoedema management was considered the role of a registered HCP at the time of the survey; however one responded and described their base as hospital (Table 5.2-1).

In the achieved sample of AHPs there were 116 physiotherapists (23% of total respondents). Of these physiotherapists, over half worked in the community (69, 59%), over a fifth worked in acute settings (25, 22%) and a fifth worked across both areas (22, 19%). There were 69 responses from podiatrists (14% of total respondents), which represents a relatively good response as there as far fewer podiatrists than physiotherapists in Scotland. The remaining AHPs (23, 5%) comprised of occupational therapists, dieticians, orthotists, pharmacists and a radiographer (Table 5.2-1).

Table 5.2-1 Characteristic of generalist health care professional respondents

Characteristic	Number (%) of respondents
	N=498
Community doctors and nurses	218 (44)
General Practitioner	116 (23)
Community/District Nurse	71 (14)
Community Cancer/Palliative Care nurse	12 (2)
Practice Nurse	8 (1)
Community specialist/psychiatric nurse	5 (1)
Other nurse	5 (1)
Hospice/Palliative Care doctor	1
Acute/specialist doctors and nurses	71 (14)
Hospital based nurse	29 (6)
Other nurse	11 (2)
Breast Care Nurse	10 (2)
Cancer/Palliative Care Nurse	9 (2)
Hospital Doctor	5 (1)
Hospice/Palliative Care Doctor	4 (1)
Health Care Assistant	1
Other	1
Allied health professionals	209 (42)
Physiotherapist	116 (23)
Podiatrists	69 (14)
Other AHP	23 (5)

All but one small health board areas were represented in the achieved sample as listed in Table 5.2-2

Table 5.2-2 Generalist health care professional respondents by geographical location

Geographical location (by health board)	Number(%) of respondents N=498
Ayrshire and Arran	80 (16)
Borders	10 (2)
Dumfries and Galloway	29 (6)
Fife	61 (12)
Forth Valley	11 (2)
Grampian	71 (14)
Greater Glasgow and Clyde	35 (7)
Highlands	33 (7)
Lanarkshire	24 (5)
Lothian	79 (16)
Orkney	0
Shetlands	1
Tayside	52 (10)
Western Isles	7 (1)
Not Known	5 (1)

5.2.2 Role in relation to lymphoedema and recent lymphoedema education undertaken by the generalist HCP respondents

A large proportion of generalists (394, 79%) indicated that their role regarding lymphoedema was referral to another service/professional and two-thirds that their role was identification of possible lymphoedema (317, 64%). Only 34 (7%) indicated that they had no role with lymphoedema.

Most respondents indicated they had not had any education/training on lymphoedema diagnosis and management in the last 5 years (368, 74%); while 70(14%) indicated that they had, the remainder did not give a response. Those who indicated that they had recent education on this subject were more likely to say their needs were mostly met (40% *c.f.* 7%; $\chi^2(1, N=424) =57.97, p<.001$), with only 1% (*c.f.* 46%) indicating that their need was not at all met.

Of those who had recent lymphoedema-related education, the majority received this through the local lymphoedema practitioner (45, 9%); and a few respondents had combined this with external providers such as HEI (13, 3%), or training provided by industry (13, 3%), attending national conferences (14, 3%), and self study (17, 4%). Only 9 (2%) had accessed HEI provision only.

5.2.3 Self identified education needs of the generalist HCP respondents

Four hundred respondents (80%) indicated at least one topic of educational need regarding lymphoedema. Specifically, over half indicated a need for education on current lymphoedema management techniques (53%), with over a third indicating need on differential diagnosis (46%), assessment of patients with chronic oedema (36%) and skin care to reduce risk of cellulitis (35%).

Acute/specialist doctors and nurses self-identified need

The only subject that was identified by over a third of all professionals(35%) in the acute/specialist doctors and nurses group was the current management techniques of lymphoedema (Table 5.2-3). There were no significant within-group differences.

Table 5.2-3 Reported self-perceptions of the educational needs of generalist health care professionals by professional group.

Focus of lymphoedema educational need	Number (%) of respondents (N=498) who were		
	Acute/ specialist doctors and nurses	Community doctors and nurses	Allied health professionals
Current management	25 (35)	140 (64)	99 (47)
Differential diagnosis	20 (28)	128 (59)	80 (38)
Exercise	8 (11)	33 (15)	86 (41)
Head and neck	4 (6)	32 (15)	12 (6)
Identification of risk	11 (16)	66 (30)	58 (28)
Acute oncology	4 (6)	31 (14)	13 (6)
Advanced disease	19 (27)	87 (40)	36 (17)
Compression garments	4 (6)	19 (9)	17 (8)
Pneumatic pumps	1 (1)	18 (8)	6 (3)
Teach self massage	10 (14)	36 (17)	53 (25)
Wound/ulcer care	13 (18)	65 (30)	30 (14)
Skin care	19 (27)	91 (42)	66 (32)
Bandaging for lymphoedema	6 (8)	23 (10)	10 (5)
Bandaging in advanced disease	4 (6)	20 (9)	9 (4)
Assessment of chronic oedema	12 (17)	109 (50)	57 (27)

Community doctors' and nurses' self-identified need

Three subjects were identified by half or more community doctors (GPs) and nurses; current lymphoedema management (64%), differential diagnosis of lymphoedema (59%) and assessment of chronic oedema (50%) (Table 5.2-3). Over one-third identified skin care (42%) and care of lymphoedema in advanced disease (40%).

However within-group analysis shows that nurses working in the community were more likely than GPs to indicate a need for education on wound/leg ulcer care in patients with lymphoedema (56% *c.f.* 17% respectively, $\chi^2(1, N=218) = 35.39$, $p < .001$).

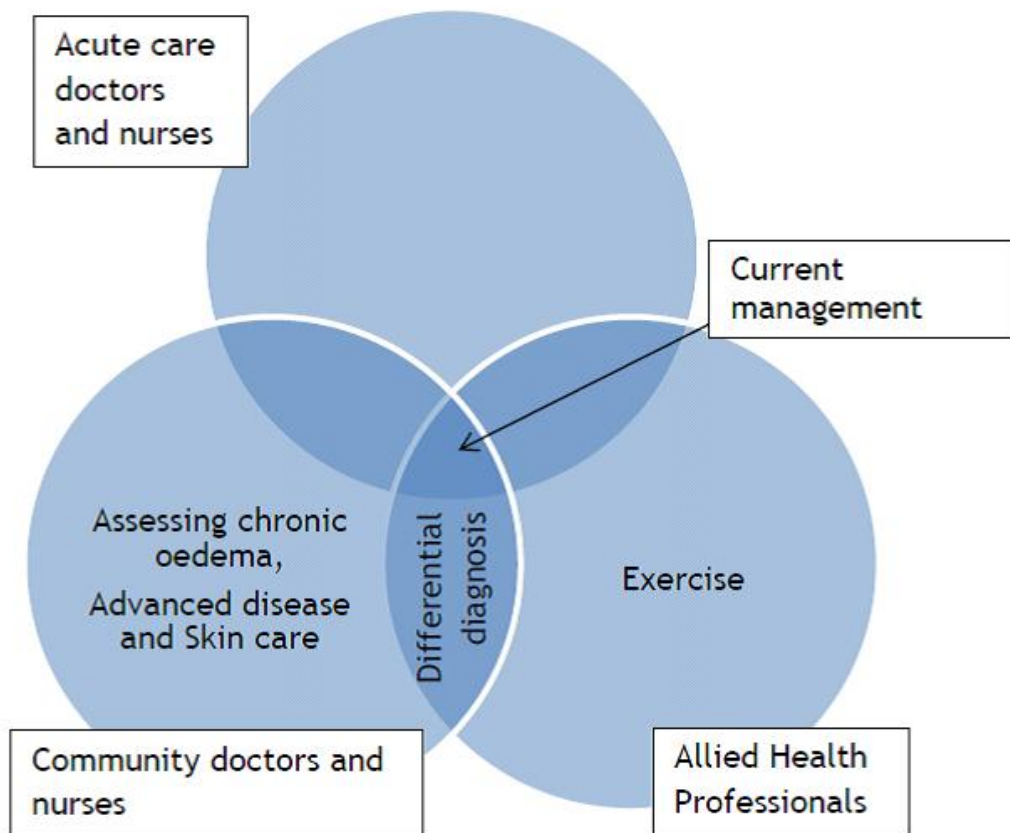
Allied health professionals' self-identified need

Three subjects were identified by a third or more of the AHPs; current lymphoedema management (47%), exercise (41%) and differential diagnosis (38%)(Table 5.2-3).

The need for education relating to exercise was identified by significantly more of the physiotherapists than the podiatrists (57% *c.f.* 23% respectively, $\chi^2(2, N=209) = 26.91$, $p < .001$) whilst significantly more podiatrists than physiotherapists identified a need in relation to skin care to prevent cellulitis (55% *c.f.* 19% respectively, $\chi^2(2, N=209) = 25.57$, $p < .001$).

Thus, taking subjects self-identified by over a third of generalist HCP respondents, current management was an educational need identified by all three professional groups (Figure 5.2-1). Differential diagnosis of lymphoedema was identified by doctors and nurses in community settings and by AHPs. Further need was identified by community doctors and nurses in relation to assessment of chronic oedema, oedema in advanced disease, and skin care. In addition to the two common subjects, education in relation to exercise was identified for AHPs.

Figure 5.2-1 The relationship between the self-identified education needs of different groups of generalist health care professionals in relation to health care setting

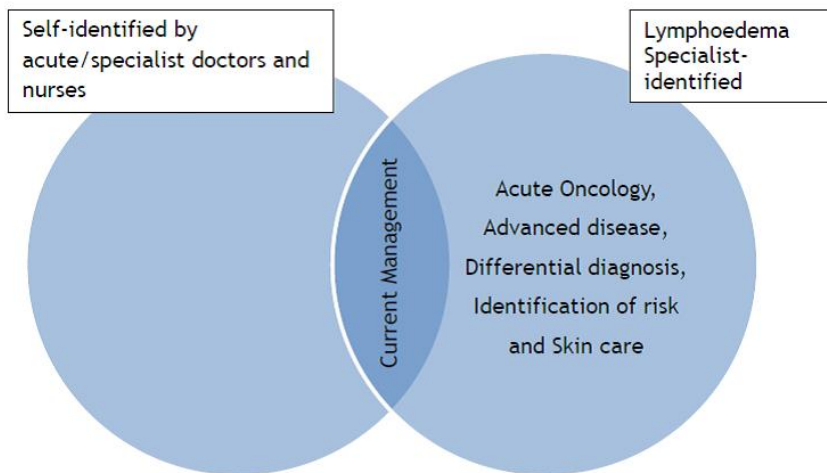


5.2.4 Concordance between the self-identified educational needs of the generalists and Lymphoedema Specialists' perceptions of the educational needs of generalists

The self-identified educational needs of different generalist professional groups concurred to some extent with the LS perceptions of their educational needs. However, there were areas identified by each that were not identified by the other.

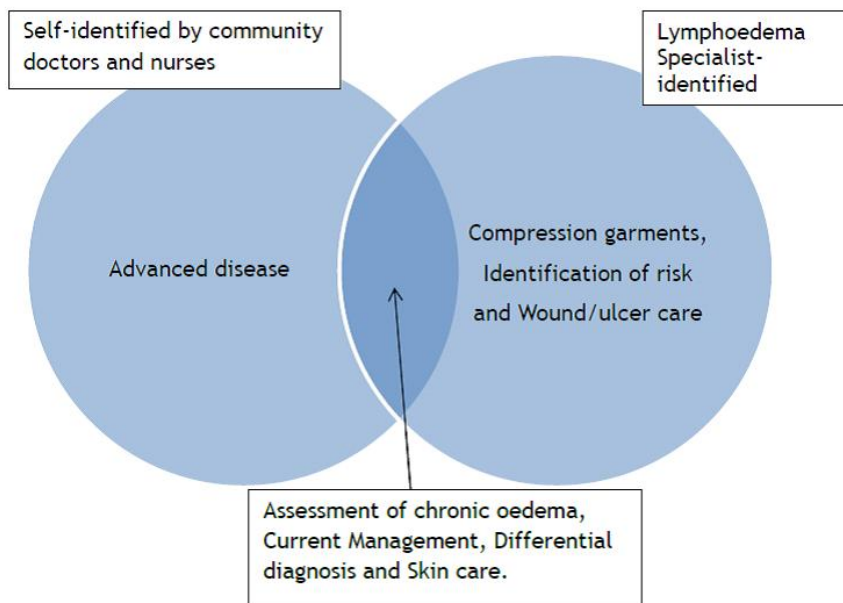
In relation to the educational needs of the acute/specialist doctors and nurses group, both these generalists and the LS identified current management as an educational need (Figure 5.2-2). However, the LS identified a further 5 that were not self-identified by this generalist group: acute oncology, advanced disease, differential diagnosis, identification of risk, and skin care.

Figure 5.2-2 Acute/specialist doctors and nurses educational needs



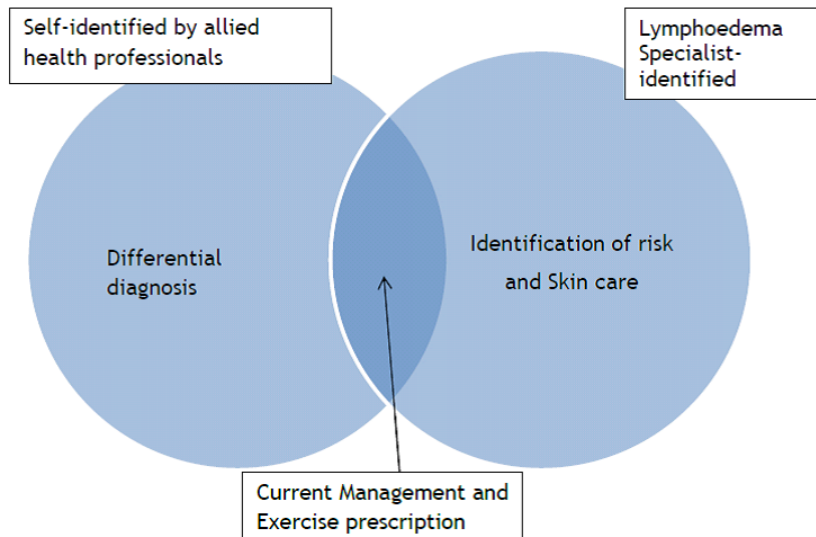
In relation to the educational needs of community doctors and nurses, both these generalists and the LS concurred on 4 areas: assessing chronic oedema, current management, differential diagnosis and skin care (Figure 5.2-3). The LS had identified a further 3 areas that were not self-identified by these generalists: compression garments, identifying those at risk, and wound care; whilst these generalists identified 1 area that LS has not: management of oedema in advanced disease.

Figure 5.2-3 Community doctors and nurses education needs



In relation to the education needs of AHPs there was concordance between the generalists and the LS on 2 areas: current management techniques and exercise (Figure 5.2-4). The LS identified a further 2 areas that were not identified by these generalists: identifying those at risk of lymphoedema, and skin care; whilst these generalists identified 1 area that LS had not: differential diagnosis.

Figure 5.2-4 Allied health professional educational needs



5.2.5 Generalists' preferences for addressing education need

A local lymphoedema practitioner was most frequently ranked highest as the preferred source of education by generalist groups (59%); while 44% indicated preference for self-directed learning on-line (Table 5.2-4).

Over a third of all groups (38%) indicated education would be most useful if it occurred in the health care setting, while a tenth of respondents (10%) indicated Higher Education provision as being useful to them (Table 5.2-5). Training provided by industry was perceived to be least useful (7%). There were no significant differences between each group.

Table 5.2-4 Generalist health care professionals' preferred method for accessing education on lymphoedema

Professional group	Local lymphoedema practitioner	On-line / self-directed
Acute doctors and nurses	35 (49%)	26(37%)
Community doctors and nurses	146 (67%)	104(48%)
Allied Health Professionals	113 (54%)	91(44%)
TOTAL N=498	294 (59%)	221 (44%)

Table 5.2-5 Generalist health care professionals' preferred place of education on lymphoedema

Professional group	Health care setting	Higher Education Institution	Industry
Acute doctors and nurses	20(28%)	7(10%)	2 (3%)
Community doctors and nurses	93(43%)	29(13%)	17 (8%)
Allied Health Professionals	78(37%)	16(8%)	16 (8%)
TOTAL N=498	191(38%)	52 (10%)	35 (7%)

5.3 Results of focus groups

The first focus group was held on the 12th May 2011 and the second on 19th May 2011. The venue for both was a seminar room within the University of Glasgow. Whilst both groups had representation from LS and generalist HCPs, the first was predominantly LS, the second predominantly generalist HCPs.

5.3.1 Characteristics of the focus group participants

The six participants of the first focus group represented 6 health board areas. Specifically, they were 2 hospice-based LS nurses who treated cancer and non-cancer-related lymphoedema as out-patients; 1 hospital-based LS nurse treating cancer-related only in-patients and outpatients; 1 LS physiotherapist who treated cancer patients in both acute and community care settings; 2 podiatrists, one from community setting and the other from hospital care setting.

The eight participants of the second focus group represented 4 health boards. Specifically, they comprised 1 GP, 1 district nurse (DN), 1 community-based physiotherapist (Learning Disabilities), 1 hospital oncology nurse, 1 hospital-based cancer nurse consultant (CNC), 1 hospital-based tissue viability nurse (TVN), 1 outpatient based LS and 1 community-based LS/DN, both caring for patients with cancer or non-cancer-related lymphoedema.

5.3.2 Focus group findings

Analysis of the data identified a number of themes that could be categorised as those which provided a context for this exploration of lymphoedema education need; and those which were of more direct relevance to lymphoedema education. Issues relating to funding were interwoven within individual themes in each of these broad categories.

5.3.2.1 Context for the lymphoedema educational needs

The context category had 5 themes: the rewards of managing lymphoedema, lymphoedema as a hidden problem, a buried problem, professional impotence and service boundaries, and resource scarcity.

5.3.2.1.1 Rewards of managing lymphoedema

Specialists and generalists described the satisfaction they derived from observing improvements to patients' quality of life as a consequence of their care and management (Table 5.3-1).

5.3.2.1.2 Hidden problem

Lymphoedema was described as being a hidden problem, both overtly and covertly. It was perceived to be a condition which patients, at times, concealed from their GP, or which was not acknowledged as a significant health problem, or about which there was a lack of information concerning the numbers of people affected (Table 5.3-1).

Table 5.3-1 Example utterances for themes rewards and hidden problem

Theme	Example utterances	Source
Rewards of managing lymphoedema	<i>...the dexterity of their hand can be affected ...[after treatment] they know they're holding the cup, or they can curl their fingers round a small handle.</i>	LS physiotherapist Group 1
	<i>...she just shut herself away, and ...stopped walking ...she is now going out, taking her kids out...</i>	Gynaecology Clinical Nurse Group 2
Hidden problem	<i>...these problems are hidden ...they [patients] don't talk about the problems ...I have one patient ...who has always worn long skirts, and she said 'I've never shown the doctor my legs'.</i>	LS nurse Group 2
	<i>....there are people out there that we don't know about, and they haven't sought out any medical help... They will ...probably when it is too late and it's more complicated.</i>	LS nurse Group 1

5.3.2.1.3 Buried problem

In the group that was mainly comprised of generalists the discussion highlighted a concern that, even when lymphoedema is known to be a problem, the current model of service provision results in deliberate failure to address presenting need because of the preoccupation of protecting individual service budgets (Table 5.3-2).

Table 5.3-2 Example utterances under theme of buried problem

Theme	Example utterances	Source
Buried problem	<p><i>....my boss is worried that it would open a whole can of worms if I got involved too much in lymphoedema ...we don't have the funding to back it up.</i></p> <p><i>.....I wasn't allowed to tell anyone I had been on it [lymphoedema training], just in case the referrals start coming through because we really can't support a lymphoedema service added on to everything else.</i></p>	TVN Group 2
	<p><i>.....we are in a structured view of don't do that because you might get flooded, but actually it might save a lot of people being in hospital which is very expensive.</i></p>	GP Group 2

5.3.2.1.4 Professional impotence and service boundaries

The generalists in each focus group expressed frustrations and disappointment that they did not have the skills and knowledge to help patients and that they were unable to refer patients to specialist services because of the constraints imposed by referral criteria (Table 5.3-3).

5.3.2.1.5 Resource scarcity

Against this background, concerns were raised about the scarcity of local LS and anxiety about the potential loss of existing resources (Table 5.3-3).

Table 5.3-3 Example utterances under themes of professional impotence and resource scarcity

Professional impotence and service boundaries	<i>Huge frustrations for us...we did have one physiotherapist but she ...restricted her services to people with breast cancer, and ...district nurses won't treat them, so we involve the practice nurses who have less experience with that. So we struggle to know what to do with them....</i>	GP Group 2
Scarcity of local lymphoedema resource	<i>.....we have a got a very person specific service. ...If anything was to happen, then the service would actually be significantly impacted.</i>	CNC Group 2

5.3.2.2 Educational needs

The education need category had 3 themes: needs of different groups, education provision and education medium.

5.3.2.2.1 Needs of different groups

Specific educational needs were highlighted for three groups of individuals: patients/carers, generalist HCPs and the LS.

a) Educational needs of patients and carers

The content of education and timing of information-giving were discussed as issues which affected care. Allied to this were patient expectations and the apparent reluctance of some patients to take responsibility for self-management of their condition. In addition, difficulties around boundaries were expressed when educating carers to assist the patient in their lymphoedema management (Table 5.3-4).

Table 5.3-4 Education needs of patients and carers

Theme	Example utterance	Source
Timing and content of education	<i>[We need] more patient information out there ... so that the patients can recognise what's wrong with them.</i>	LS /DN Group 2
	<i>It's difficult to know exactly when to pitch that information, I think sometimes they need reminders along the way, maybe when they go for their check ups.</i>	LS nurse Group 1
Patient expectations	<i>They do really devolve the responsibility. And no matter how you try to educate them in what's best for them, they anticipate that you are going to fix it.</i>	DN Group 2
Boundaries and educating carers	<i>And they [paid carers] have boundaries as well, what they will do, and what they won't do. ...some put [lymphoedema] stockings on, and others say "that's not my job; I'm not trained to do that".</i>	LS nurse Group 2

b) Educational needs of generalist HCP

The self-identified educational needs of generalists related to difficulties they encountered in all stages of the patient journey including establishing a diagnosis, delivery of care and long term management (Table 5.3-5). Developing a background level of knowledge during undergraduate training was seen as beneficial, as was a wider awareness to other agencies (Table 5.3-6).

Table 5.3-5 Example utterances regarding educational need of generalist health professionals

Theme	Example utterance	Source
HCP knowledge to establish a diagnosis/refer	<i>...podiatry needs training to recognise it. ...there is no way I could definitely diagnose lymphoedema, ...[maybe] if we were better educated in who to refer to, and at what stage to refer, what to look out for, how to recognise signs and symptoms.</i>	Podiatrist Group 1
	<i>...their GP ...said it's not too bad ...if it gets any worse we will refer you. Whereas you really want them three months prior...[it's] very hard for them to get a diagnosis, they are sent from pillar to post for all different types of tests.</i>	LS nurse Group 1
Amount or type of training need of HCP	<i>I don't [feel prepared] at all. As a TVN... all I've done on lymphoedema .. is go on the two day awareness....</i>	TVN Group 2
	<i>We've started by running half-day sessions for district nurses to teach them bandaging of chronic oedema patients. Half a day is not long enough ...it has to be followed on. The nurses could go away and not see a patient for weeks, so it should be ongoing.</i>	LS nurse Group 2

Table 5.3-6 Example utterances regarding timing of lymphoedema-related education of generalist health professionals

Timing of training	... <i>getting the education in earlier, at student nurse level.</i>	TVN, Group 2
	[introduced at undergraduate level] <i>because it's something you see it a lot, no matter what level you are at".</i>	Podiatrist Group 1
Wider education and awareness	... <i>some of the biggest challenges that we've had is getting financial support through benefits, recognising that lymphoedema is a thing that causes a major disabilities and impacts on their existence. I've actually had to be at a number of tribunals, for people that are pursuing disability living allowance, and other benefits. It's not just within health, but I think other agencies as well.</i>	CNC Group 2

c) Educational needs of lymphoedema specialists

Self-identified needs expressed by specialists captured both the initial motivation to pursue the specialist training and the need to supplement it with shadowing, networking and opportunity for updating skills and reviewing of standards of practice (Table 5.3-7).

Table 5.3-7 Example utterances regarding the educational needs of lymphoedema specialists

Theme	Example utterance	Source
Motivation to pursue specialist training	<i>I came to do two modules ... because I felt as if I needed to have that information so that I was assessing the patients correctly.</i>	DN/LS nurse Group 2
	<i>Having now done two or three modules, I feel a bit more equipped.</i>	LS Physiotherapist Group 1
Need for supplemental practical workplace mentorship and networking	<i>...after you have that initial theory to ...[it would be good to] be seconded to a working clinic... I suppose a good three to four weeks; ... with someone who is experienced, and getting hands on supervision with real patients... Networking as well, you learn lots just from ...speaking with others in the peer group.</i>	LS Physiotherapist Group 1
Need for regular update or review	<i>...being able to review [skills], maybe yearly, just like we do with any other courses. I think its something that needs to be maintained to keep it to a certain standard.</i>	DN/LS nurse Group 2
	<i>[with] a mixture of up to date information, new things, research and papers online that you could source...[but] definitely the practical skills you need.</i>	LS nurse Group 1

5.3.2.2.2 Education Provision

It was evident that those who had participated in educational events perceived these valuable, not only in terms of informing their practice and understanding of lymphoedema, but also in terms of meeting and networking with others with a professional interest in lymphoedema. However, opportunities for undertaking formal education were perceived to be limited in the existing financial climate.

Despite this, a range of potential providers were identified to address educational needs including HEI, local LS and commercial companies. The perceived value of accredited academic courses of universities was not only related to the provision of contemporary research-based knowledge but also the credibility of qualification in terms of strengthening their ability to influence practice. The perceived value of work-based training by LS was viewed as beneficial by both generalist and LS as an opportunity for reciprocal learning (Table 5.3-8)

Table 5.3-8 Source of lymphoedema-related education

Theme	Example utterance	Source
Sourcing funding for education is difficult	<i>Nobody's willing to give you funding. ...to do the two modules I had to get the funding myself, because my health board wouldn't pay for it.</i>	DN/LS, Group 2
HEI education gives credibility as well as currency	<i>You feel it's always better to have formal training when you are in a small speciality, for other people to acknowledge what you do...</i>	LS nurse2, Group1
Work-based training remains of benefit	<i>...for the podiatrist service ... [the best approach] would be someone giving a presentation at one of our full staff meetings.</i>	Podiatrist, Group1
	<i>We feel we're isolated in lymphoedema, but ...when we go out and do joint visits, we learn from the district nurse ...so it's a two way thing.</i>	LS nurse, Group2

However, the sheer volume of the patient caseload and geographical spread of LS was perceived to present a barrier to the delivery of local educational events. Disappointingly, LS who had offered such training reported poor uptake from generalist professionals in contrast to the uptake of other educational events.

They were unclear for the reasons underpinning this but felt that whilst some education events, such as palliative care, afforded some opportunity to highlight lymphoedema, they nevertheless constrained their ability to impart knowledge and skills they felt necessary for the effective management of lymphoedema by generalist professionals (Table 5.3-9).

Table 5.3-9 Barriers to providing training

Theme	Example utterance	Source
Barriers to in-house training	<i>I am so inundated with referrals that I just have very little time for education [teaching] at all.</i>	LS nurse, Group1
	<i>...geographically ... getting from one end of XXX [health board] to another we just don't have the time to do it</i>	LS physiotherapist, Group1
Poor uptake when in-house education is offered	<i>We offer study days at least twice a year for nurses, physios and all health care professionals except GP's. We run three for GP's on their own in the evening with hot food ...we had one response for three attempts. That was with the points you get for GP study days. We've had a 'lunch and learn' at the hospice, and we got 15 district nurses to come in for that... [but for specific lymphoedema bandaging] I think we got three responses, and we had to cancel it. So we ran it again, and it was cancelled again.</i>	LS nurse, Group1

Participants who had attended educational events sponsored by commercial companies reported that these were useful in terms of providing awareness of latest products and how to use them safely. However frustrations were expressed about an embargo by some employers on utilising commercial companies as an

educational resource. This was perceived as not only limiting educational opportunities but also as insulting professional integrity (Table 5.3-10).

Table 5.3-10 Accessing commercially sponsored training

Theme	Example utterance	Source
Training provided by commercial companies - useful	<i>We do get a lot of garment companies in, study days ...quite helpful, because sometimes it's the only way to find out about the choice for patients with garments.</i>	LS nurse, Group1
Training provided by commercial companies - problems accessing.	<i>..it creates a little problem ... in district nursing, because we are not allowed any [company] reps in ...in case they sway us to write prescriptions. ... we haven't actually had a rep in for 12 months... It is an education, they're bringing in research, and I really object to being told that I could be swayed by a sandwich at lunchtime to write a prescription for someone!</i>	DN, Group2
	<i>... if you are going to be using those products anyway, it's not swaying you more towards it. But I've seen inappropriate use of dressing, ...when I'm sending people out with certain dressings, they're being used inappropriately because they [community nurses] don't have the knowledge and skills out there, because they aren't being kept up to date with changes.</i>	TVN Group 2

5.3.2.2.3 Education media

There was acknowledgement of the potential for greater use of technology for education but also that it has its limitations for the learning of hands-on skills. Both generalists and specialists recognised that some elements of learning needed to be hands-on and had the advantage of participation in spontaneous questions and answers, although interactive online learning was recognised for the latter.

Table 5.3-11 Medium of education online or face-to-face

Theme	Example utterance	Source
Technology increasing accessibility to education	<i>...to have it online rather than coming to an institution ...because of the nature of cut backs and everything else within the NHS, it's easier to access in your own time.</i>	LS Physiotherapist, Group1
	<i>We use a lot of tele and video conferencing, in a clinical setting ...where patients in XXX [remote town] will be sitting with a professional, speaking to a specialist say in XXX [city], for specific advice.</i>	CNC, Group2
Perceived limitations to on-line learning	<i>Even just feeling the skin changes; you can't teach that [online]. That's what I felt in the course; the modules that I did and working along with a mentor. I was doing sessions with XXX [LS], and actually physically watching her then doing them myself. I thought that was a massive benefit.</i>	DN/LS nurse, Group 2
	<i>I think too if you were in the room, the spontaneous question and answering, whereas I think if you are watching it, it's very difficult. You might think of something you could ask, but if it's not interactive at that time, the moments gone and it goes out your mind.</i>	LS nurse, Group1

6 DISCUSSION OF PHASE 1

6.1 Phase 1 findings in relation to evidence and policy

This chapter discusses the findings from Phase 1 in relation to evidence and policy as it existed at the end of 2011, in order to reflect the factors which influenced Phase 2 of this study.

The findings of Phase 1 of this study confirmed previous reports that HCPs in Scotland had unmet educational needs relating to the care and management of patients with lymphoedema (Bulley 2007; Sneddon et al 2008) but expanded the understanding of educational needs of specific HCPs within different healthcare settings. The mixed method approach adopted for data collection allowed the findings from the surveys to be explored by qualitative means, which highlighted the relevance of survey findings within the working lives of HCP.

LS whose job titles reflected their specialist role in relation to lymphoedema were predominately working the majority of their time with lymphoedema patients and within an urban setting. This is perhaps not surprising, as it could be expected that those who worked in rural areas were more likely to work as both a generalist and a subject specialist, however, without a designated service other generalist HCPs may not realise the availability of local specialist expertise. It was interesting that neither job title, proportion of working time spent with lymphoedema patients nor the urban/rural setting was a predictor of whether the specialist had attended an education update within the last 2 years. It would seem that the main enabling factor was a supportive manager, since being given the study leave and course fees are likely outcomes of that support, at least for some. Attendance at education updates aligned with how well the specialist felt their educational needs were met.

In the previous study by Sneddon et al (2008) 79% (74/93) LS had indicated a need for further learning and updating of skills, whilst in the current study two-thirds of LS indicated their needs were mostly/completely met. Difference in the related questions asked in the two surveys may partly explain this difference, but this study also found that most specialists had attended an education/training update

within the last 2 years which showed a strong correlation with a perception of needs being met. Despite this, anxieties were expressed in the survey and focus groups that with contemporary restraints on study leave, currency might not be maintained. Confidence in remaining up-to-date with innovations in the field was clearly a concern of LS, ranked highest in terms of their own educational needs. This may be because the rate of research and publication has increased dramatically over the last few years, sufficient to launch subject specific peer reviewed journals such as the *Journal of Lymphoedema*. It may also be a reflection of the expectation of the generalist HCP found in the surveys, that there is an expert to support, to advise and take referrals.

However, there is inequity in access to LS service due to constraints imposed by referral criteria, which result in some cases of identified patient needs not being addressed. Access to specialist services appeared better-developed for patients with cancer-related lymphoedema. Ultimately, this results in both generalists and specialists feeling professionally impotent and unable to provide consistency of care across various care settings. For example, a GP described inadequacy of patient management that resulted in prolonged hospital admission, whilst a hospital-based LS expressed concern that patients were discharged with inadequate care provision into the community. Of concern was that with a conservative estimated UK prevalence of 1.33/1000 (Moffatt et al 2003), Phase 1 found that lymphoedema was not only a poorly recognised and unreported problem, but was at times hidden for fear that services would be overwhelmed by referrals, and the impact that this would have on individual service budgets. Whilst gaps in service provision remain, generalists may be required to become better educated in the care and management of their patients with lymphoedema.

There were, however, a number of barriers to generalists becoming better-educated and skilled in the direct care of their patients with lymphoedema, including time and funding constraints, and competing priorities. These are likely to remain while lymphoedema has a low profile compared to other LTCs, despite its significant impact on the physical, mental and social wellbeing of affected patients. Over 10 years ago, the lack of robust evidence in relation to effectiveness of lymphoedema management techniques foiled efforts to develop a

Scottish Intercollegiate Guidelines Network (SIGN) guideline for lymphoedema. However, it may be timely for this effort to be revisited as the research evidence base on lymphoedema management techniques has since increased. The absence of a robust clinical guideline to inform the care and management of patients with lymphoedema is against the thrust of recent Scottish Government policy, which seeks to improve the health and wellbeing of all patients living with any kind of LTC (Scottish Government 2007).

A relatively high proportion of the specialists had undertaken both basic and advanced training at an HEI. However, increasing difficulties in attending centralised courses was anticipated in the financial climate. This perhaps influenced the generally positive attitude found towards greater use of technology to access education. It seems that online learning resources (OLR) such as podcasts and short film clips have potential to maintain and increase access to education; while HCP-accompanied teleconferencing-style consultations with a remote specialist could provide clinical support, as well as a learning experience for less experienced clinicians. Such developments would align well with current NHS Scotland initiatives (Scottish Centre for Telehealth and Telecare 2011) and they would allow face-to-face teaching time, with its incumbent travel time and study leave, to be appropriately used for development and review of practical skills.

The three educational needs that LS' identified for all generalist HCP were current management, identifying those at risk, and skin care to prevent cellulitis. This may reflect recent research that patient morbidity, and thereby health care cost, is significantly reduced if patients are identified early in the progress of the condition and given the appropriate advice and education (Todd et al 2010; Stout, Pfalzer, Springer et al 2012). Training on measuring and fitting of compression garments is included in HEI-accredited courses for LS and well-supported by the suppliers, therefore it is not surprising that this is not high on the list of needs of short term priorities for specialists. However LS did identify appropriate use of compression garments as an educational need for generalists. This need could be verified by an investigation of critical incidents or patient harm from inappropriate use of compression garments. The suggestion of integrating relevant education into undergraduate medical and other HCP training was well-supported

and was a contemporary theme of discussion internationally, through the Education Forum of the International Lymphoedema Framework (International Lymphoedema Framework, 2011).

Whilst generalists recognised that they had educational needs relating to lymphoedema, LS who had attempted to provide educational events at a local level reported poor uptake rates. The reasons for this are likely to be multi-factorial and include issues already discussed, such as the relatively low profile of the condition and competing priorities, and constraints relating to time, funding and study leave. Other potential sources of education also appeared to be curtailed through the perceived barrier to events sponsored by commercial companies. If true, it would go against the thrust of government policy, which has urged the active fostering of partnerships between industry, health boards and universities (Scottish Government 2009).

The study found that the nature of HCPs education need was specific to their role and setting. Community nurses prioritised wound care but GPs did not; physiotherapists and podiatrists priorities differed. Topics in which there was concordance between the views of LS regarding the generalist HCP need and their self-identified need may be a good indication that positive practice change will occur from education. Education via technology offers a likely route to address this to some extent, through media such as the health service intranet or a publicly available OLR.

Where the specialists identified an educational need that was not self-identified by the target group, a more strategic approach would be required, involving making more explicit the relevance of the education to the target group, as well as a considered delivery method. Conversely, specialists need to consider whether those topics which were identified by the target group but not by the specialists could actually produce positive patient outcomes, or if they are perceived needs for some other unrelated reason.

Unmet educational needs in patients, their carers, generalists and specialists have impact on the quality of life of the patient. The identification of the need for patient education by HCPs fits with the thrust of recent policy which encourages

partnership arrangement between service provider and service users to manage health and LTCs (Long Term Conditions Alliance 2008, Scottish Government 2010b). The need for education for paid social carers may not have been previously identified and would require cross-agency working.

6.2 Phase 1 Limitations

A limitation of Phase 1 was that the distribution of the questionnaires relied on third parties. It would have been unfeasible to check that the cascade system for each profession had reached the target population in each health board. However the representation gained from the main target professions was good.

A potential limitation of surveys is that they can be prone to respondent bias (Parahoo, 2006). However the generalist survey was responded to by those without apparent specific interest in the subject; 1 in 5 did not identify a lymphoedema-related educational need and only 1 in 7 had attended any education on lymphoedema in the last 5 years. The low number of practice nurses responding was disappointing but is likely to reflect the recruitment strategy adopted in this survey, since cascading information through nurse managers in health boards excluded practice nurses who are employed directly by GPs. Given that district nurses provide care for housebound patients and practice nurses provide care for patients who are sufficiently mobile to attend the GP Practice, it would have been useful to compare the need of these two groups of healthcare providers. Targeting the practice nurses in addition would have enhanced Phase 1.

7 CONCLUSIONS FROM PHASE 1

HCPs have lymphoedema-related educational needs that are specific to their role and care setting, and believe these could be met by a number of means, including online resources (OLR) supporting more traditional models of face-to-face contact. The recommendations made by this researcher in a report to the Scottish Government (Davies 2012) take account of the working context of the professionals who participated in Phase 1 of the study and are listed in Appendix 8.

Research and development in lymphoedema has increased significantly in the last few years. HEI accredited education and regular Continuous Professional Development (CPD) of specialists was perceived as maintaining best and safe practice. One way of identifying and sharing best practice would be for an expert group to produce an evidence-based clinical guideline or resource for the care and management of patients with lymphoedema.

HCPs not specialising in lymphoedema (generalists), need education in recognising and managing lymphoedema, and information about specialist services and education opportunities. Continuing education for all generalist HCP should include the topics of current management in lymphoedema, skin care to prevent cellulitis, identifying those at risk, and information on accessing specialist services.

The survey results indicated an expectation that local LS could provide in-service training particularly in practical skills e.g. bandaging. However, when this was explored further in the subsequent focus groups, there was recognition that educational opportunities were limited due to financial and time constraints. Technology seemed to offer an opportunity to create a virtual network of lymphoedema expertise nationally, thereby supporting the specialists and generalists. One-to-one advice on complex cases was seen by specialists and generalists as useful to immediate patient care and effective education; such consultation could be provided virtually. Two conclusions relating to ongoing CPD and support are that LS could benefit from a core website for communication and the sharing of resources; whilst there is a need for generalist HCPs to have access

to information on current best practice in lymphoedema care, possibly via relevant intranet services.

The findings from this Phase 1 cannot be separated from the context in which HCPs provide care and they expose an inequity of access to specialist lymphoedema care in many parts of Scotland. Lymphoedema was perceived not only as an often unrecognised and under reported problem, but also one that was deliberately ignored due to fear of overwhelming services and the resultant impact on the budget of individual services. Consideration should be given to creating systems for local generalist HCPs to have virtual consultations with a lymphoedema specialist. The contemporary funding by Macmillan Cancer Support of a two year post of Lymphoedema Project Manager to work with Scottish Health Boards to develop and implement a national policy on lymphoedema provided a new opportunity to leverage change and it was this realisation that provided the impetus for Phase 2 of this doctoral study.

8 INTRODUCTION TO PHASE 2

This chapter describes the progression of the study from a post-positivist approach described in Phase 1, to a collaborative, more interpretive, action research (AR) approach appropriate to the research questions of this second phase. Therefore, a transition occurs from the detached third person voice, to an immersed account, using the first and second person where appropriate (McNiff 2013a; Coghlan and Brannick 2014). The account acknowledges the positionality of the researcher, with a reflexive approach to writing. This is discussed further in the Methodology section for Phase 2 (Chapter 10).

8.1 Progression to a collaborative study

I shared the Phase 1 findings with my SLPN peers in the spring meeting of 2012 (SLPN minutes, 06.03.12). We agreed that, until the next meeting in 3 months, the members would consider how the group might respond. I attended meetings to bring an education perspective, but as a LS for years, and working clinically intermittently, I was considered a practicing LS.

After Phase 1, my thinking was initially focussed on the lack of access to specialist support/advice described by generalists. Concurrently, NHS Scotland was promoting telehealth-type projects and encouraging exploration of the potential for technology-enabled-remote-consultations. I investigated whether video-conferencing style consultations had been tried elsewhere between specialists and generalists with lymphoedema patients and found they had been used to some extent between a London medical consultant and doctors in developing countries (Ellis 2012, personal communication). In Lincolnshire, LS were being supported remotely by a medical consultant (Keeley 2012, personal communication). Despite my investigations through professional networks and the grey literature, little else had been published or recorded internationally.

In addition, I explored locally whether we might learn from other medical fields. For some more remote areas of Scotland, such as the islands, this type of technology had been used to give specialist dermatology support to local generalist HCP.

At the subsequent SLPN meeting we discussed the idea of supporting HCP in the wider community by providing consultative advice remotely (SLPN minutes 05.06.2012). Barriers were perceived to be funding for specialists to provide such a service and a shortage of sufficiently skilled personnel to backfill specialist clinics; a lack of skills and knowledge to apply advice once received; and practical difficulties regarding elements of the patient assessment. By the SLPN meeting of September 2012, discussions with NHS24 and other agencies had not managed to overcome these barriers and our focus moved to supporting the learning of the generalists, and ourselves, the specialists who support them.

In the SLPN meeting of September 2012 I asked my peers to consider the idea of developing the SLPN's existing website into a hub of learning resources or even starting on an entirely new one in a different format e.g. blog-based. I had previously built the group's existing website as a voluntary project, with core members of SLPN providing text to be uploaded. The main purpose of the website, at that time, had been to describe basic lymphoedema self-care to sufferers and carers, and to list contact details of specialist services in Scotland. It was designed to be suitable for patients to read, but with additional links for HCP. However, not many UK-specific web-links were available at that time.

We discussed the further development of the existing website into a more comprehensive Online Learning Resource (OLR) with the specific aim of addressing some of the identified educational needs from Phase 1 (SLPN meeting 04.09.2012). The primary concern of those present was the sustainability of the developed OLR given that, at the time, the group were dependent upon me to edit their website. It was agreed that I would explore the feasibility of developing the OLR as a collaborative undertaking. It became clear that an investigation into, and modelling of, the processes involved in building the OLR could provide the basis for the academic research that forms Phase 2 of this doctoral study. My peers perceived that by working within a formal academic structure they were more likely to make their individual learning explicit, satisfying organisational requirements for continued professional development (CPD) (SLPN minutes 04.09.12). The possibility of contributing to knowledge about the process of OLR development offered a sense of contributing to a wider purpose, potentially helping similar unfunded groups. In addition, potentially raising the political

profile of the group, which was particularly pertinent due to the work of SMASAC and the Macmillan Project (see section 1.2).

I drafted a research proposal for the section of work which would become Phase 2 of this study. The draft research proposal and an outline programme of work were discussed at the subsequent SLPN meeting (SLPN minutes 11.12.2012).

Ethical approval for Phase 2 was granted 27th February 2013; in addition, the study was registered with clinical governance offices in each of the participating health boards (Appendix 9).

The collaborative work of Phase 2 of this study was therefore launched at the SLPN meeting held on 12th March 2013 (SLPN minutes 12.03.2013). This meeting is subsequently termed SLPN1.

8.2 Phase 2 Aim and research questions

The overall aim of Phase 2 was to explore the processes involved in developing an OLR, within existing infrastructure, to meet identified lymphoedema-related educational needs of HCP, with a view to developing a model for OLR development that could inform other groups.

At the outset, the broad research questions were ‘what have we got, how might we use it, what helps and hinders, what will we learn, what might others learn?’

The specific research questions are given here for clarity, but they developed chronologically as cycles of research progressed, consistent with the AR methodology employed (Chapter 10).

The specific research questions to be addressed by Phase 2 were:

1. What are the existing expertise and resources, and how might these be utilised to develop an online learning resource (OLR) to meet identified educational needs?
2. In what way, if any, does the process of co-development change the way the group functions?
3. What are the facilitators and barriers to the development of the OLR?

4. What are the key components of a model for producing the OLR and how do they relate to each other?
5. What learning was experienced in modelling the development of an OLR by clinicians and how might that inform education theory?

The questions, even in broad form, highlighted that the study was based on two intertwining streams of activities. The first concerned the development of the OLR. The second concerned understanding the process of OLR development and its theoretical fit and potential application. The former met the service need; the latter met the academic requirements for this doctoral study.

9 PHASE 2 LITERATURE REVIEW

9.1 Introduction

The literature search aimed to identify articles on OLR developments, and whether the developmental process had been modelled. Key words were extrapolated from the research questions and systematically expanded with similar terms, resulting in searches which used combinations of the following:

- community of practice/ community of learning / professional learning network
- practitioner*/clinician*/nurse*/therapist*/health care profession*
- collaborative/cooperative/collective and develop*/build
- online/on-line learn*/educat* resource/website/portal
- to meet identified education*/learning/information need
- model*

*The asterisk demotes truncations to include plurals and extension.

9.2 Literature Search Strategy

Individual systematic searches were conducted of electronic databases across science, education and business fields (section 9.3 for rationale). These included EBSCO, CINAHL, Health Source (Nursing/Academic edition), LISTA (Library Information Science and Technology Abstracts), Philosopher's index, Professional Development Collection, PsycARTICLES, Psychology and Behavioral Sciences Collection, PsycINFO, SocINDEX, Teacher Reference Centre, EMBASE (Ovid, Medline, Pubmed), Web of Science, SCOPUS, Business Source Premier, ERIC and the Cochrane Library.

Further, PhD theses were sought through ProQuest Indexed Thesis, in addition to searches of the grey literature and hand searches of relevant journals and mixed media sources.

The searches were limited to publications in English language and between the years 2006 and 2012. The selection of 2006 reflected the timing and emerging acceptance of Web 2.0 technologies in health care delivery and education (Giustini 2006; Boulos, Maramba, Wheeler 2006; Boulos, Wheeler 2007). As the study progressed the search was repeated intermittently for contemporary

studies. Earlier seminal studies were included where they provided important context.

The literature search identified only a few high quality studies describing collaborative development of OLR by HCP. These focussed on evaluation of the OLR as an end product, rather than examining the process of OLR development itself, or the learning to be gained from this process. Therefore, the search was expanded to include education and business fields. In addition, service development initiatives and opinion pieces were considered where these were well-supported by theory, in order that reflective critique might inform the planning, conduct and data analysis of this study.

One of the recognised difficulties in examining the literature around OLRs is the different ways in which the terminology is used which makes meaningful cross-comparison studies difficult (Moore, Dickson-Deane and Galyen 2011). For the purposes of my literature search the term OLR was used as an umbrella term for any online (on-line) education/learning resource, hub or portal.

In reviewing identified abstracts, I focussed mainly on the type of group (population) developing the OLR, the intended audience, the type of OLR developed and whether or not significant additional resources were available (e.g. funding and specific technical support). OLRs developed by academic faculty for use within an academic environment e.g. development of OLRs exclusively for students on undergraduate courses, were excluded on the basis that the developers could be assumed to have specific teacher training /qualifications.

9.3 Main themes identified from the literature

The key features of identified papers are tabulated in Appendix 10.

Practical elements which emerged as important within the literature were:

- Funding requirements and how these are reported;
- Time demands for collaboration;
- Requirement for project management skills;
- Training needs and/or technical support for participants;

- Sustainability and flexibility to meet ongoing demand.

The literature in relation to OLR development by HCP is presented first, followed by the broad themes which influenced the planning of the study: OLR design for learning and pedagogy; group description (network, community of practice or other); learning from modelling participative processes; and information seeking behaviours of HCP. Further literature was reviewed as the study evolved.

9.3.1 OLR development by HCP

The development of OLR by HCP without some academic connection was sparse but studies which described the process and pitfalls of OLR development which informed this doctoral study are described.

In a Higher Education Academy (HEA)-commissioned study by Farrimond, Dorman, Cockcroft et al (2006) clinical educators worked with university-based medical students to develop OLRs. The study highlights that contextual acceptance may affect sustainability. The process of OLR development, through an iterative method of AR, produced a resource with good fidelity to the requirements identified. Farrimond et al (*ibid*) describe how they defined requirements based on the literature and a student survey, created a prototype then used expert review of the prototype. Evaluation of the learning package included usability, likability and perceived value as an instructional tool, using an end-of-task questionnaire and questioning by the researcher. A CAL (computer-aided-learning) package was developed and was positively evaluated for usability. However, non-stakeholder experts remained sceptical about the ability of this medium to teach practical skills, which could threaten sustainability or roll-out of the package.

However an iterative study design can present difficulties for the researcher; some process-related issues were highlighted in a review of government-funded research, between 2003 and 2006 (Street, Swift, Annells, et al 2007). Undertaken in Victoria, Australia its aim was to improve an existing palliative care information website; more specifically, to address information gaps highlighted in national government reports, improve the awareness and commitment of professionals to palliative care, and provide quality information for patients and carers. The

authors included academic and research nursing staff. The study population comprised the website users: HCP, patients and carers.

Street et al (2007) used a mixed-method AR approach of four cycles to iteratively design the website content and lay-out. Early cycles identified the specific needs of target audiences through a literature search, expert review and an online survey through the pre-existing palliative care website. In a subsequent cycle, a gap analysis was undertaken with user groups. However, in contrast to the resource-bound context of Phase 2 of this doctoral study, the data were fed to external IT experts to develop the pilot website. Final modifications were made after online survey evaluation by key stakeholders and users. Results of the final survey were compared with the results of the pre-development online survey in relation to the original website.

The new website was evaluated more positively than the original in relation to the stated objective to address specific identified information gaps; 82% *c.f.* 65% of users respectively found the information they needed although 23% *c.f.* 29% of users respectively still returned that information had not been easy to find. Thus there remained issues with the layout and design. Regarding improving the awareness and commitment of professionals to palliative care, this is more difficult to establish.

Specific to the processes of an iterative research design, some of the study objectives changed in response to emerging data. There were topics suggested by HCPs that fell outside the original remit of the project. Consequently, some comparisons between the evaluations of the original and new pilot website were not possible.

There are problems comparing some findings to the pre-existing website since the initial data were not segregated between public (patients and carers) and HCP in the same way as in the final evaluation. Such issues arise because, consistent with AR, the objectives of the study change in response to early data which was an issue for me to consider in relation to Phase 2. The researchers could not establish whether the information needs of GP were met due to a low number of GP respondents, however the needs of HCP overall seemed to be mostly addressed.

Street et al (2007) did not claim a particular model of AR but their study would evaluate well against criteria for AR defined by Davison, Martinsons, Kock (2004). Given the embedded nature of the researchers in AR studies there was a surprising lack of clarity on roles of the study team and a lack of reflexivity; this may be due to word limitation on publication however, which is an acknowledged difficulty in reporting AR (DeLuca, Gallivan and Kock 2008).

Sustainability of the website as a user-responsive resource was not expressed as a specific objective and yet is an implied aim throughout the study report. It would appear however that the sustainability of the website would rely on further funding. Despite the use of significant resources the Street et al (2007) study had difficulty establishing that they had addressed all the identified needs nor established the sustainability expected of AR (Reason and Bradbury 2008; Hynes 2013). For Phase 2 of this doctoral study to address identified needs, and achieve sustainability without additional resources, these issues would need explicit attention from the start.

In the UK, Gresty, Skirton and Everden (2007) reported the development of an OLR relating to genetics for health professionals. Despite some lack of clarity of the cycles of work and level of involvement of different participants, Gresty et al provide a useful consideration of literature to inform the design of OLR, and further evidence that a high level of acceptability might be achieved through the combination of theory and local HCP involvement. Their study commenced with a survey-based needs assessment for the resource, which included only student and qualified nurses rather than a wider range of HCP. There followed cycles of work by the project team to develop the content of the educational website based on the combination of survey results, pedagogic literature and the unspecified contribution of stakeholder HCP from the local genetics service. The website at time of reporting was being used in practice by student nurses of the host faculty and was available to other clinicians by open access. The evaluation process included verbal feedback and an online feedback facility; however evaluation was reported to be ongoing and therefore remained inconclusive. The authors (*ibid.*) described a high usage for the preceding period, mid-2006, which might imply a high level of acceptability. This prompted the addition of monitoring of OLR usage analytics to our plans.

Some of the reviewed papers led me to consider what resources counted as our existing resources. For example, Welsh and Houston (2010) reported the development a nursing portal in an American medical centre. The portal was developed by a team which included nurses working with IT technologists, however a top-down rather than practitioner-driven approach was implied. Their evaluation found that nurses accessed mainly patient details and other organisational communication rather than using the portal as an OLR. Interestingly, the authors reported no incurred costs and yet there were multiple examples of additional work described e.g. the informatics nurses provided additional training; and portal development time was absorbed into regular work hours, therefore opportunity costs are implied. This was relevant to Phase 2 of my study, since it was anticipated that our OLR development would require re-allocation of time currently used for other educational activities.

Akin to our context, Ruiz, Teasdale, Hajjar, et al (2007) described an increasing demand for education and a finite number of specialists to educate/support generalist HCP in relation to gerontology in the USA. The authors described the formation of a voluntary consortium of medical educators to develop an e-learning package to enhance geriatric education. Unfortunately the OLR developed had yet to be formally evaluated and further reports of resources used in this project seem lacking. The literature search subsequently included consortia but no significant studies were found.

Phase 2 study design and sustainability plans were also informed by Behl, Houston and Stredler-Brown (2012) who reported an evaluation of the development of a Learning Community. Again, reflecting the context of our study, the community described by Behl et al, (*ibid*), was formed to support the use of telehealth to address shortages in specialist services for infants with hearing loss in the USA. The study used two surveys to collect qualitative and quantitative data to evaluate the learning community as a process. Although products or artefacts, are not the primary objective of a learning community, Behl et al (*ibid*) reported three outcomes of this study; the learning, the evaluation of the process, and production of a free online guide to relevant tools and resources. A number of issues in this paper informed my study: the reported time and effort for busy

clinicians was not quantified but noted as significant, and issues around sustainability were implied to be both financial and reliant on the efforts of participants. The financial investment and technical support they received would not be possible in my context. The crucial role of the facilitator and the sharing of responsibility for leadership and feedback to the larger group were carried forward to my planning with the SLPN group. The study by Behl et al (2012) would have been strengthened by greater use of qualitative data given the relatively small number of participants, and greater clarity around the learning gained, however the candid reporting of the issues around sustainability was a useful finding from the literature review.

Contemporary to the planning of Phase 2, Archambault, van de Belt, Grajales et al (2012) published a protocol for use in an international scoping review on the use of collaborative writing applications (CWA) (wikis, Google documents, Google Knol) in facilitating Knowledge Transfer (KT) in health care. The review was being conducted by a large collaboration of, mainly Dutch and Canadian, health organisations. It was of interest in relation to Phase 2 of this study since it suggested the identified educational need in Phase 1 might be considered KT, i.e. collaborative writing of an OLR to share contemporary research-based practice with both peer specialists and other generalist HCPs. The protocol highlighted that despite an increase in related research, questions remained around the safety and reliability of these CWA tools, their lack of traditional authorship, and the legal implication of decision-making based on their content, the protocol advocated the rapid production of guidelines for collaborative online writing for HCP. Points of concern were duly noted and included in discussions with the LS participants of Phase 2 in Cycle 1 (section 12.1). Having considered the participants as clinicians, I next considered them as educators, and what level of pedagogic theory supported health education websites.

9.3.2 OLR design for learning and pedagogy

Few studies at the time of this literature review had examined the underlying pedagogy of health education websites. One of the few, claimed pedagogic shortcomings specific to surgical education websites (Pillai and Dennick 2012). Based on social constructivism, the authors recommend that the tools of Web 2.0 technology be used to create greater collaboration and two-way communications,

rather than the impersonal, teacher-centred focus, of the websites they reviewed. Given the predominant lack of teacher-training among the SLPN participants of Phase 2 the underlying pedagogy of the OLR developed was anticipated to be a matter of interest.

The expectations of Phase 2 participants regarding the intended OLR were likely to be based on their previous experiences of online education. This drove a further aspect of the literature search. In a systematic review of qualitative studies looking at the experience of HCPs in the UK with online education, Carroll, Booth, Papaioannou et al (2009) identified that relevance by tailoring content was one of the underpinning core requirements, just as important as pedagogic approach and presentation. A key difference of the studies in their systematic review and this doctoral study was that they related to distinct, structured courses, which included assessment and tutor engagement, which were not relevant factors to our OLR. Of relevance however were findings on self-directed learning, including the flexibility to learn at an individual pace. Significantly, some learners did not want to engage in social learning, such as discussion boards, which was an issue we would consider in relation to our potential end-users. The importance of usability and effective search functionality was affirmed as being generalised across all professions and noted for Phase 2.

With a dearth of literature within the health care sector I considered whether the general education literature could inform the OLR template in relation to educators working collaboratively. Exploring the use of blogs to increase teacher collaboration, Byington (2011) makes a strong theory-based case for working in communities of practice (CoP) for support and to strengthen teaching practices. Further, that using blogs reduces the costs associated with face-to-face meetings. However, she advocated a hybrid community where, in addition to online work, there is some face-to-face contact. Providing a step-by-step guide, Byington gives the features and comparative advantages and disadvantages of wikis and blogs. Drawing on the work of Dubé, Bourhis and Jacob (2005), Byington highlights that the factors relevant to the success of online CoP include leadership, topic relevance and supportive organisational environments; a core leadership team is claimed to keep the work focussed and progressing. Grounded on a good range of relevant literature Byington provided a useful, theory based, practical overview. As LSs we aimed to develop an area of the OLR for sharing teaching resources and

peer support. However, the salience of the topic to my peer group, the leadership skills and particularly time available, and the support of their organisations were yet to be established. We would therefore have to explore these factors within the process rather than assuming their pre-existence (Cycles 1 and 2; Sections 12.1, 12.2).

9.3.3 Network, Community of Practice or other

The literature reviewed above included professional networks, communities of practice (CoP), learning communities, and a voluntary consortium. This was a deliberate aspect of the search strategy based on two perspectives. First that, although the SLPN were a network by name, there was no record, or group recollection, of a critical discussion of competing descriptive terms for the group. Second, that definition of these terms varies within the literature. Handley, Sturdy, Fincham et al (2006) describe considerable variation in how CoPs are described and characterised in the literature, from homogenous and close, to heterogeneous and confrontational. In related literature, Brown and Duguid (2001) argued that professionals participate in loose networks of practice. However, Wenger (1998) described a CoP as being a conceptual framework, and that what was important was how group members worked and interacted, not what they called themselves. On this basis, I decided not to restrict the literature review in this respect, nor to ask my peers to define the SLPN group at the outset, but to explore the in-process behaviours and interactions, and let the question of group identity emerge, if it became a significant theme. This, and the preceding subsection, led me to the question of what was known about learning from modelling, and in particular modelling participative processes to develop OLR within communities or networks.

9.3.4 Learning from modelling participative processes

In relation to information seeking, Case (2012) suggests that both models and theories are simplified versions of reality, where the content is typically made more concrete in models by the use of diagrams. Models describe relationships between concepts, as do theories, but models tend to be tied more closely to the real world (*ibid.*), the complexity of real-world open systems being implied. Case

warns that models can have good explanatory factors for particular phenomenon but that over generalising can be a problem.

Research which aims to learn from modelling participative processes of design-and-build, such as OLR development, can be approached as AR or as Design Science. The principle difference between these is the focus of the research; in essence, AR focuses on the processes within production, whereas Design Science tends to focus on the artefact or end-product (Papas, O'Keefe and Seltsikas 2012).

No literature was identified that was specific to modelling the process of OLR development by HCPs. However, Seddon and Postlethwaite (2007) used a participative AR approach (section 10.2.1) with school head-teachers to develop a model of reflection for collaborative construction of knowledge. The study describes five cycles, from group agreement of the research question, through creation of a model prototype from their literature review, to iterative cycles of refinement of the model. Data were drawn from online dialogues and face-to-face interviews. The process of constructing a model from a theoretical basis and refining it through cyclical online review was informative, as was the type of data collected. The model itself is one of reflection on knowledge construction rather than on the overall process of OLR construction. Their model could be used within Phase 2, as a tool for critical reflection on decisions regarding content, but would involve an additional learning requirement and time commitment from the SLPN participants I thought unfeasible. However, the inclusion of reflective logs or diaries to document the thinking behind process changes, seemed a useful additions to Phase 2, if agreed by SLPN participants.

A similar study, describing the construction and use of a model to gain a better understanding of knowledge creation within a CoP, was reported within the Knowledge Management (KM) conceptualisation of organisational knowledge (Jakubik 2008). The participants were described as managers, teachers, students, and experts from two companies in Finland. The KM literature is predominantly focussed on gaining competitive advantage in business, where knowledge is seen as both commodity and as process (*ibid*). The study used an AR approach, and key to the data collection process was the use of value mapping (Allee 2003) to gain a better understanding of interactions in the community. The main finding of the

study was presented as the attention to human discourse, that is, the intensity of interactions, and the values placed on them, as knowledge was created which was an understanding said to be lacking in KM literature. The salience of this study to mine is the concept of knowledge as commodity and as process, particularly because, at the time of my study, Scottish health care was managed within a framework of asset management (section 1.2). In addition, Jakubik (2008) brought home that the learning theories used in education are not the only way of thinking about learning, which suggests the approach to data analysis should be open and exploratory, rather than beginning from an assumption of Situated Learning described in CoP literature (Lave and Wenger 1991) or social constructivism commonly associated with group or open learning (Schunk 2012). Further, that in modelling the process of OLR development by HCPs during Phase 2 there may be relatively fixed pre-requisites and processes to describe, but there may also be less tangible, but no less important, fluid elements to be found in the interactions between participants and possibly between the technology used. Considering the interaction of HCPs with technology led me to review the literature on the information seeking behaviours of HCPs.

9.3.5 Information seeking behaviours of HCP

During Phase 1 of this study new research highlighted that lymphoedema patients' emotional and information needs had to be met for self-care approaches to be successful (Armer, Brooks, Stewart 2011; Williams 2011). The provision of such support implies HCPs need accurate clinical information, which was found to be lacking during Phase 1 of my study. These new studies therefore further supported the aims of Phase 2. For the OLR to address the unmet need for information, an understanding of the information-seeking behaviour of HCP was required.

In a comprehensive review of the evidence between 1995 to 2009 in relation to the internet-based searching behaviours of doctors and nurses, no significant differences were found between doctors and nurses (Younger 2010). Regardless of the availability of internet resources, there was preference by nurses and doctors to ask a colleague; a lack of ready access to computers in the clinical area contributing to this factor. The review highlighted the differences in information-seeking practices of doctors and nurses based in large hospitals, as opposed to those who were geographically remote or community-based. The former were

more likely to use an academic model of searching for information. Further research into the differences between the idealised academic model of evidence searching and real world practices was recommended, but since the aim of Phase 2 was accessibility to appropriate information for HCPs, whether urban or rural, this point prompted inclusion of both rural and urban end-users in Phase 2 plans.

Likewise, an online survey of UK physiotherapists in 2011 found that despite the availability of focussed medical and physiotherapy search tools, hospital library and, for some, university resources, the majority of respondents (567 of 774, 73%) most frequently used Google (Harland and Drew 2013). The authors of the study broke down the results by salary banding, and made some assumptions about level of use which were not supported with empirical evidence. Nevertheless, some of their findings were useful to deliberate in the planning of content and access for the OLR in Phase 2 of this study. Harland and Drew (2013) found that participants most commonly sought evidence-based guidelines for practice (685 of 774 respondents, 89%). Getting irrelevant results was reported as more frustrating than not being able to find what was looked for (44% *c.f.* 26%). Being unsure of robustness was also frustrating (298 of 744 respondents, 39%). Surprisingly, fewer than half had heard of NHC Evidence (47%) and fewer still had used it (35%). These findings supported the creation of a lymphoedema-specific hub of information (i.e. OLR) providing it linked to recognised sources of evidence-based guidelines and that the OLR should be easily found through open search engines such as Google.

In contrast to earlier studies, Perzeski (2012) found a trend toward greater internet use for information by HCPs, rather than to asking a colleague or searching printed material. Consistent with the study by Younger (2010), the time available and urgency of information-need influenced the sources used. The findings of the Perzeski study were based on USA podiatry physicians and therefore may not be directly transferable to UK HCPs. However, in time-pressured environments, ease of access to IT equipment, and the usability of the found resources seem likely to affect future use.

9.3.6 Summary of literature review at outset of Phase 2

There is a dearth of good quality research describing OLR development by HCPs, in non-academic settings, to meet identified HCP educational need. The practical elements of funding, time, project management skills, training and IT support, and ongoing sustainability are consistent issues, but are often not explicitly quantified and specifics are difficult to compare across studies. Funding of OLR development was not always clear but where given could be quite significant (Appendix 10), but even then, it was not always sufficient for sustainability of the developed resource. Most OLR development studies had academic involvement of some kind, either within the research team or as end-users of the developed resource. In the period before starting Phase 2 there was no conclusive evidence as to which template of delivery (traditional website, blog or wiki) was better for OLR development but there was increasing interest in this question. Moreover, within the health disciplines concerns persisted about the tools in relation to their safety, reliability and authorship, as well as legal implication of decision-making based on them. Few studies had looked at the underlying pedagogy of health education websites, but based on education theory, researchers advocate that by working critically as CoP the application of underpinning pedagogy would improve. Groups involved in participative development of an OLR included professional networks, CoPs, learning communities, and a voluntary consortium. The given definitions make direct comparison difficult; however the argument is that the mode of working and communicating is more significant than nominal title. The consideration of knowledge as an asset (from KM literature) was salient, given the asset-based approach to management in NHS Scotland at the time. Although there had been modelling of the process of knowledge creation within CoPs that were developing an OLR, the process of OLR development by HCPs, had not yet been modelled. Review of the literature had provided useful practical considerations to take forward to the planning stage of Phase 2 with SLPN peers.

10 METHODOLOGY

10.1 Introduction

The first section of this chapter describes my position as researcher within this doctoral research as it transitions from Phase 1 to present AR as the approach considered for Phase 2.

The second section considers AR as an approach, a process for the conduct of the research and generation of knowledge. It then goes on to discuss the role of the action researcher and ethical considerations in AR, the tools of the action researcher, and how AR has been used in this study, with a justification of the tools used for data collection, including how rigour is addressed.

The third section concludes with a summary of the reviewed literature regarding methodology as it pertains to Phase 2 of this study.

10.1.1 My position as researcher in this thesis

In Phase 1 I described my position as post-positivist, taking a stance of critical realism (Bhaskar 1989; Benton 2004). Notwithstanding an acknowledgment of the lens of interpretation, the Phase 1 objectives assumed an external, objective positionality as researcher. Placing Phase 1 on the continuum of Table 10.1-1 (below), one would begin at the top of the chart (numbered 1) with the decision to use a survey and descriptive quantitative data, but travel down towards subjectivist assumptions as the context of the educational need is explored with participants in the focus groups (numbered 3). Subsequently, Phase 2 was situated exclusively within my peer group and aimed to achieve an understanding of the processes involved in the collaborative development of an OLR. This would represent a core assumption of reality as a social construction where the research methods of hermeneutics (interpreting meaning) were more appropriate (numbered 5).

Table 10.1-1 Continuum of research approaches

In Social Sciences		Core ontological assumption - reality as...	Basic epistemological stance	Research methods
Objectivist approach ↑ ↓ Subjectivist approaches	1	Concrete structure	To construct a positivist science	Lab experiments, surveys
	2	Concrete process	To study systems, process, change	Historical analysis
	3	Contextual field of information	To map contexts	Contextual analysis of Gestalten
	4	A realm of social discourse	To understand patterns of symbolic disclosure	Symbolic analysis
	5	Social construction	To understand how social reality is created	Hermeneutics
	6	Projection of human imagination	To obtain phenomenological insight, revelation	Exploration of pure subjectivity

(Adapted from Morgan and Smircich 1980)

Consistent with Phase 1 there was an assumption that those people with a need/problem were most likely to understand it and be able to suggest solutions. Similar to Phase 1 an alternative perspective would inform the interpretation of Phase 2 data; this would come from theory, or the recognised literature on topics, as they emerged from critical reflection on the developing process. This acknowledged that the social context creates and informs the social construction and therefore current theory or concepts can inform the interpretation (Archer 1995). Within a society or community group, understanding of contexts will be socio-culturally dependent, therefore it can be argued that people from outside of the context will only ever have a partial understanding, but understanding what differences there are between the insider and outsider perspective, can be just as informative. This is one of the arguments around the issue of the embedded (insider) researcher (Coghlan and Casey 2001). By being a practitioner-researcher one might have an inside view but there is also the danger that assumptions are

made that peers feel and experience the same. Arguably the very position of researcher may put someone in a slightly different position to their peers (Coghlan and Casey 2001; Coghlan 2011). Positionality in terms of insider/outsider is discussed further in section 10.3.1.

My evolved position in this thesis, although remaining post-positivist, might be closer to what Mauthner and Doucet (2003) described as, a hybrid position, that of knowledge being both 'out there' and 'in here'. That is, whilst knowledge of an objective reality might indeed be limited by our ability to investigate it, people create their own perspectives of truths (or realities) which can coexist, and that greater progress might be achieved by trying to appreciate different stances. To achieve useful outcomes in terms of collaborative work it may, at times, be useful to aim for confluence of ideas rather than expecting convergence of perspectives.

I interpret my hybrid stance as a product of my biography and context.

Professionally, my knowledge and skills largely developed through the period of positivist-driven evidence-based medicine movement (1980s and 1990s), and yet I always understood medicine to be both art and science. This holistic perspective was refined by over 10 years of work within the hospice movement, where the very latest scientific developments in symptom relief worked hand-in-hand with art, faith and compassion. This was a context where the aim of scientific excellence of practice went alongside questions of what it is to live a good life and give good care. In contrast, this was followed by 6 years of commercial healthcare education in industry, where technician business models and project management skills dominated. That is not to say that I could have articulated my stance in this way at the start of this study. Each decision on what data to collect and anguished deliberation of which data analysis method to use started with the simple reflection of whether it felt as though it 'fitted' the question being asked. The literature was then explored to support or contest that view. My ongoing reflections during the conduct of this study included sometimes deeply convoluted contemplations as I explored my positionality, and indeed whether I leaned more to a positivist or relativist epistemology. I concur with Denzin (1994) that representations of research findings might always be argued to be self-presentations; and I acknowledge that there will always be limits to reflexivity and how aware we can be of the influences present (Mauthner and Doucet 2003). The process of making assumptions and values explicit during this study gives

greater trustworthiness to the conclusions drawn, however temporary. There was recognition that such work can impose the values of the academic community on practitioners (Lave and Wenger 1991; Hall, Leat, Wall et al 2006); but the conclusion of my reflections was that the study reflected my values as a practitioner as well as clarifying my positionality as a researcher, and as such represented virtuous research (McNiff 2013b); a position I presented for peer review to experienced AR researchers as ‘critical friends’ at an international conference in June 2015 (Noble-Jones 2015).

10.1.2 The context for Phase 2

The situation at the end of Phase 1 and therefore the context for Phase 2 can be summarised as in Table 10.1-2:

Table 10.1-2 Characteristics of the context at the start of Phase 2

Community identified problem: SLPN members had evidence of educational need regarding lymphoedema in HCP affecting their service.
Potential to address problem: online resources acceptable to those expressing a need but no additional resources to develop them.
An apparent willingness among SLPN members to participate in group action to bring about change.
An interest in learning from the process.
Recognition by some members that increased political profile or group identity might be usefully gained.

SLPN discussion between the two phases of this study identified that although creating an OLR was important, the focus of research and learning would be the process of development. This had the perceived potential to create knowledge which could be useful to similar groups. Based on this group decision for a collaborative project which also sought to create knowledge, the literature for the family of methods under the action research (AR) approach was reviewed.

10.2 Literature pertaining to action research

10.2.1 The action research approach

Action research as a term was first used by social scientist Kurt Lewin in describing studies to improve the situation of minority peoples (Lewin 1946) but was contemporary to similar studies by John Collier, and Trist and colleagues at the Tavistock Institute, UK (Adelman 1993).

The general characteristics of the different approaches of AR include:

- Researcher works with(in) a community
- An intention of improvement of situation
- An iterative series of change interventions
- Explicit cyclic (spiral) processes of plan, act, observe and reflect
- Self-improvement of participants/empowerment
- Creation of new knowledge which may inform theory.

Adapted from Cohen, Manion, Morrison (2011)

A variation to this is Practitioner Enquiry (Inquiry), where the individual practitioner e.g. teacher in the classroom, works on theory-informed change (Baumfield, Hall, Wall 2013; Whitehead 1989, 2010). This approach produces change of a situation starting with a change of the individual teacher behaviour or approach.

The characteristics of AR mirrored the context regarding lymphoedema-related education need, at the end of Phase 1 (Table 10.1-2). AR is an approach which has evolved into many styles of application and interpretation, as it has been developed by practitioners from different disciplines over the last half a century; variations include participatory AR (Whyte 1991), cooperative inquiry (Reason 2003) and participative inquiry (Reason and Bradbury 2008). Reason and Bradbury (2008) define AR as a family of approaches in which open criticism is encouraged, which is reflected in literature across education, information systems and organisational development domains (Noffke and Somekh 2009; DeLuca et al 2008; Coghlan and Brannick 2014). However Levin (2012) claims a paucity of real

critique and debate across methods of AR in the academic literature. Notwithstanding this criticism, authors frequently acknowledge the advice given by ‘critical friends’ in the development of theory from AR, at pre-publication stage (McNiff 2013a; Noffke and Somekh 2009; Coghlan and Brannick 2014). The apparent lack of critique in the public domain may therefore be an inbuilt consequence of a dialectic approach in AR. Dialectic is a term with multiple definitions and interpretation (Basseches 2005) but in this thesis is defined as facilitating rational discussion of alternative explanations for findings. The aim is not to find *the* truth, but an understanding which has meaning to the participants, sufficient to let them move on to the next action, whilst accepting that the interpretation may be temporary and change with new findings; transferability is dependent upon the interpretation of the reader. Dialectic as a form of data analysis is discussed further in section 11.4.5.3.

Group level participation in AR aspires to a power balance between the participants and the researcher; indeed the function of some AR projects is explicitly emancipatory or to address power imbalance e.g. feminist AR (Reid 2004). Whether power balance is ever truly achievable, or realistic, is an issue that is beyond this thesis but has been the specific focus of other AR studies e.g. Dillon 2014.

Whether group or individual AR, the degree to which the change is political, critical or emancipatory will vary with the stance of the researcher, on who commissioned the research, and the aim of the study (Zuber-Skerritt 1996). This is discussed in relation to this study as findings are interpreted.

AR has an ethos that reflects its historical development. In relation to the situation of minorities, Lewin’s approach (1946) was to discuss the problems and how to proceed with those who had carried out the work within that particular context, who would then be active participants in the AR process, taking decisions, and monitoring and noting consequences. Despite Lewin’s use of scientific axioms, education researcher Adelman (1993) described him as a scientific pragmatist who used a dialectic process to seek best fit based on an interpretive epistemology. Lewin perhaps now would be described as a critical realist.

In industry, Lewin's work challenged the contemporary Scientific Management approaches which analysed individual task components of processes (Taylorism), feeding in to the systems theory approach of the time (Adelman 1993). This line of development can be seen through to contemporary literature on organisational development and information systems (Goldkuhl 2012), on which this study draws to some extent, and into contemporary discussions about AR's appropriateness as a meta-method for those approaching from a stance of complexity theory (Radford 2007; Phelps and Graham 2010). In using the AR approach, real-life situations are conceptualised as non-linear systems with feedback and feed-forward stimuli, and are open to constant environmental changes and participant interactions, including the reflexivity of the researcher; this describes well my conceptualisation of AR during Phase 2.

Meanwhile in British education by the mid-seventies AR was being used to encourage teachers to reflect critically on their work as a form of curriculum development (Stenhouse 1975) to enquire collaboratively into their own practice, with Elliott, Adelman and colleagues presenting teachers as researchers (Kemmis 1993). Another form of categorising the various approaches to AR in education is seen in Noffke and Somekh's 2009 seminal text in which the collected papers are presented in a framework of 'professional', 'personal' and 'political' depending of key focus of study (Noffke and Somekh 2009). The present doctoral study might be described as professional but both political and personal issues emerged.

In health care, a systematic review of AR found huge variation in the adopted approach (Waterman, Tillen, Dickson et al 2001). Of the 59 reviewed studies the majority were within the nursing profession (70%). The authors (*ibid*) described three broad philosophical approaches: critical, participative and qualitative; however it is unclear why they used this particular taxonomy. The primary aims of most studies reviewed by these authors were assessment of current situation, development of changes and evaluation of outcomes. These aims were reported to have been achieved to various degrees, but professional and personal development were noticeable outcomes throughout.

An identified difficulty of AR arises from its collaborative nature. Adelman (1993) and later McNiff (2013a; 2013b) raised the ethically-based question of whose research it is, or as Abraham and Purkayasha (2011, p129) ask, 'Whose knowledge

counts?' Even if the initial research question is a collective idea and the involvement of the community in the project process is made explicit, the literature is less clear about the community's role in the data analysis. It seems the data analysis and conclusions are generally still completed by the academically-connected researcher rather than the collective, but perhaps this is pragmatic if practitioner/participants do not have the time or knowledge to analyse data. Involving communities where possible may present opportunities of levelling of the high ground of the academia-based researcher and the swampy grounds of the reflective practitioner (Schön 1983, 2004). Arnstein's ladder of citizen participation (Arnstein 1969) was for a long time the benchmark of peoples' participation in AR. It described 8 stages, from Manipulation (non-participation at level 1) through Consultation (level 4) to Citizen Control (level 8). However critics point out that the level of participation is a much more complex concept (Tritter and McCallum 2006; Collins and Ison 2006). The nature of the study and researcher's stance will affect the roles of participants and the researcher (Coughlan and Shani 2005).

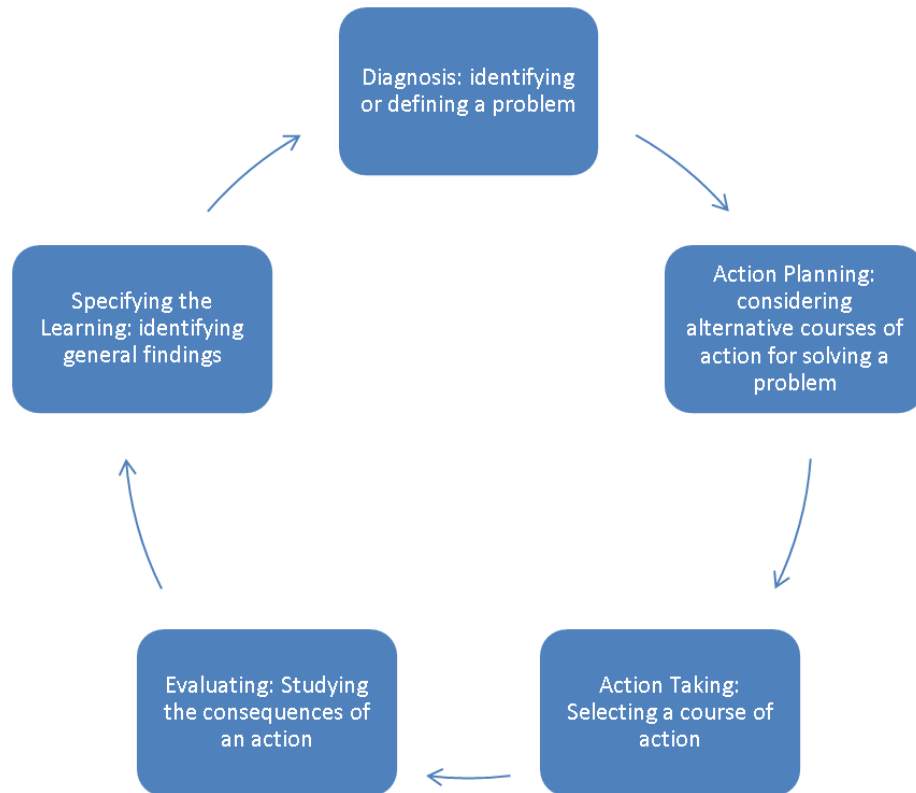
Different values and cultures can arise even within the same discipline e.g. industry, education and health, and this, along with the context of time and history, can give rise to different approaches to AR (Somekh 1995). Thus the conduct of AR will depend on its objectives, context and on the stance of the researcher, the latter defining the role of the researcher within the research. Throughout the reporting of Phase 2 the level of participation and roles taken are therefore made as clear as is practicable for the readers' interpretation.

10.2.2 The action research process

Lewin conceived the process of AR as 'a spiral of steps, each of which is composed of a circle of planning, action and fact-finding about the result of the action' Lewin (1946, p 38). He described the process as beginning from a general idea of what might be a desirable objective followed by a period of fact-finding (reconnaissance) to decide on the first action. Execution and evaluation of the action follows, which then feeds into the next cycle of planning, action and evaluation.

Susman and Evered (1978) developed Lewin's concept by separating the diagnosis of the problem and the action-planning and adding an explicit stage of specifying the learning (Figure 11.2-1).

Figure 10.2-1 Susman and Evered's 5 stage model



(Adapted from Susman and Evered, 1978)

Susman and Evered's 5 stage model is described within the context of Organisational Science, where the researcher works within the client infrastructure and may be involved in only one, two or all of these stages. Making the specification of the learning explicit emphasises the knowledge creation aspect of the process; the learning can be theoretical as well as practical (Waterman et al 2001; Chiasson, Germonprez, Mathiassen 2008). Susman and Evered (*ibid*) described the creation of 'know-how' rather than 'know-that'. The creation of new knowledge through AR is discussed further in section 10.2.3.

Depictions of the AR process include cyclic, spiral and more complex serial flowchart models (e.g. Elliot 1991). An inherent problem with all such models is that actions appear sequential; the influences on the next action may in fact be more complex in real life. Advocates of AR argue that it is this real-life data that makes the created knowledge relevant or meaningful (Levin 2012; McNiff 2013a).

In an effort to provide methodological guidance and address external criticism of methodological sloppiness in AR within the Information Systems domain, Davison et al (2004) defined criteria for evaluating the fidelity of the AR process. What is seen by some as criteria-to-strengthen-rigour is however criticised by others (e.g. Coghlan 2011) as positivist-based and counter to the iterative essence of the approach. DeLuca et al (2008) call for a synthesis of terminology in order for the merits of AR to be understood by a positivist as well as an interpretivist audience. An alternative perspective to presentation of AR findings is given by Somekh (1995), who contends that a series of case studies, though not regarded highly in positivistic science, constitutes a body of knowledge similar to 'case law' in the legal tradition.

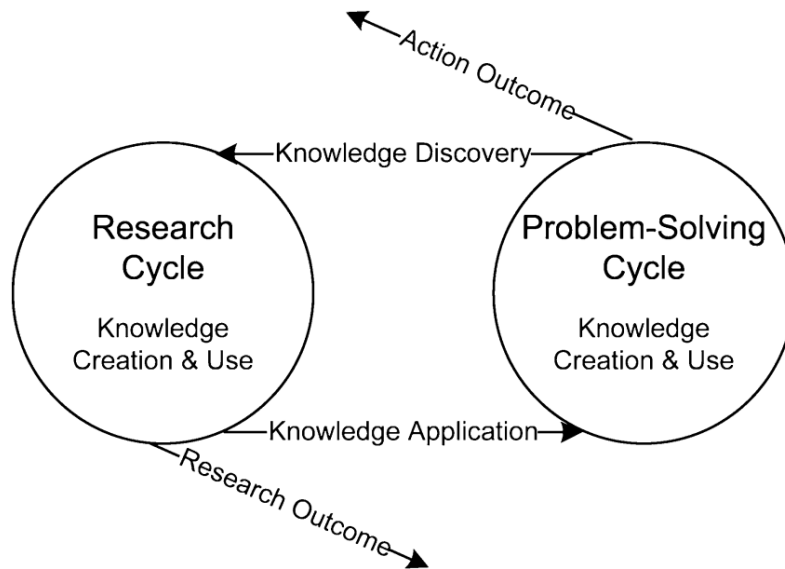
In summary, as with any research process, the explicit reporting of process in AR is as important as the reasoning and specification of learning or new knowledge created. Tools such as the criteria of Davison et al (2004) may help communication of rigour and fidelity of AR process to a positivist audience and aid understanding of the process for some participants. The Davison et al (2004) criteria were used in Phase 2 as described in section 11.4.4.

10.2.3 Action research and the creation of new knowledge

The researcher within the AR process has to be cognisant of two main aims, the change improvement which is the subject of the action, and the research aim of knowledge creation. McKay and Marshall (2001) argued for a new conceptualisation of AR as a dual rather than a single cycle process; the second cycle of the model being a research cycle which is superimposed on the problem-solving (action) cycle. Consistent with other research approaches, the researcher has a research question, engages with the literature to clarify the issue, and identifies any existing theoretical frameworks. The research is then planned so that the research question might be answered. Where it differs in AR is that it is superimposed on a problem-solving cycle and either cycle may inform the other so that the question may change or new questions may arise. McKay and Marshall (2001) described several points at which new knowledge may be created; about the selected research framework, the method, or the research question, as well as practical knowledge about the problem, and the problem-solving framework or problem-solving method. This was later depicted by Chiasson et al (2008) as two

parallel and interacting cycles (Figure 11.2-2). Although not rich in description, its imagery clearly shows that the problem-solving cycle can inform the research cycle as much as research knowledge can be applied to subsequent iterations of the problem-solving cycle; and that each cycle has an outward-going outcome. The diagram was useful for explaining the concept to SLPN participants in Phase 2.

Figure 10.2-2 The dual cycles of action research



Reproduced from Chiasson, Germonprez, Mathiassen (2008) with permission

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Notwithstanding the immediate contextual knowledge which feeds in to the problem-solving cycle, the type of knowledge created will depend on the nature of the problem being considered, the context, methods used and the researcher.

The epistemological roots in AR are usually claimed to be interpretive rather than positivist (Abraham and Purkayasha 2011), since the data are context (people, time and place) dependent. However, the AR literature shows a range from broadly post-positivist in organisational development (e.g. DeLuca et al 2008) to almost entirely interpretive in emancipatory feminist AR (e.g. Reid 2004). The ontology and epistemology of the AR approach is an issue which continues to be debated (Susman and Evered 1978; Stephens, Barton, Haslett 2009; Coghlan 2011; Goldkuhl 2012).

Susman and Evered (1978) argued that by using an alternative philosophical background to the prevailing positivist perspective in Information Science, researchers could produce action principles (or guides) for dealing with many different situations, rather than rational rules of operation; action principles being more useful in the unpredictable situations of working organisations. This they termed the development of *practics* or 'know-how'. Educational research has similar complexities to other domains where the development of 'know-how' might be just as significant as the development of theory. Similarly, these ideas of collaborative study to develop know-how echo with modern healthcare leadership, such as collective leadership and adaptive leadership (Bevan and Fairman 2014; Heifetz, Grashow, Linsky, 2009).

The literature shows various conceptualisations and terms for 'know-how'. Know-how is context-dependent process knowledge, its comparator being 'know that' which is knowledge that can be symbolised, written down, contained or owned. Elliot (1991) described a situational understanding termed 'practical wisdom', referred to as practitioner-derived knowledge. Other similar terms include action-oriented epistemology of practice (Cook and Brown 1999), situated cognition (Clancey 1997), and practical knowing (Coghlan 2011). Long before this, Aristotle described *phronesis*, a practical wisdom, something similar to prudence (Garver 1994). Therein lies a difficulty; finding words which adequately capture the type of knowledge created. McNiff (2013a) described seeking internal (I-enquiries) and external knowledge (E-enquiries). The difficulties of expression and of demonstrating tacit as opposed to explicit knowledge, except by validation in action, create a difficulty in measuring the contribution of AR to social science.

Returning to Lewin's foundational descriptions, AR was described as a process of re-education, although this part of his work is largely ignored in the literature (Coghlan and Jacobs 2005). The term transformational is used in contemporary literature (Reason and Torbert 2001), implying that there is a change of values and tacit knowledge that subsequently changes behaviour. Such change of value is arguably the main aim of emancipatory and feminist AR (Cohen et al 2011). Coghlan and Rashford (2006) described third order change as one of the main aims of AR; that is, change that creates an environment where fundamental assumptions and attitudes about everyday practice are questioned. Similarly, Coghlan and Brannick (2014) draw on Mezirow's theory of Transformative

Learning, giving examples of the critical thinking indicative of “deep learning”. In a review of AR in healthcare, Waterman et al (2001) found a similar emphasis on participant learning, whether the intended workplace-change was successful or not. Again, this is reflective of much of the modern rhetoric on leadership within healthcare, that successful change needs to be transformational (Bevan and Fairman 2014). AR therefore seemed to have an educational potential for the participants, and potentially for the organisation, but to be successful as AR, attention to the dual cycles of action (problem-solving) and research is essential.

10.2.4 Summary of theoretical concepts

AR is pluralistic in its epistemology and methods. It has evolved and diversified into many expressions of form but the basic components remain the same. The researcher collaborates with members of a community, even if for individual practitioner enquiry, in a change intervention aimed at situational improvement and creation of greater understanding or knowledge. AR uses an explicit, iterative, action-reflection cyclic process. The degree to which the change is political, critical or emancipatory will vary with the stance of the researcher and the aim of the study. Different types of knowledge, including practical (know-how) and propositional (know-that), may be produced and learning may be transformational. In the study of the process of development of an OLR by HCPs it would seem reasonable to assume that different types of knowledge may be produced.

10.3 Method aspects in action research

This section will discuss the role of the researcher and the crucial nature of positionality within AR before going on to present some of the ethical issues particularly pertinent to the approach. The data collection methods, mix of data sources and how the data might be analysed are then discussed with particular reference to this study.

10.3.1 The role of the researcher and positionality

Positionality refers to both the stance (ontological and epistemological) of the researcher and their insider versus outsider role in the research, since the latter depends on the former (Coghlan and Brannick 2014). My ontological and epistemological stance was described in section 10.1.1. I will first present researcher positionality in the AR approach compared with other forms of research before returning to my stance and positioning in this study.

People live and work in open rather than the closed systems, in contexts where variables cannot be controlled. The external, observational objectivity of the researcher to describe causality between intervention and outcome is therefore challenging and may be inappropriate. The types of question asked, the decisions on which data are collected, and the methods of analysis, bring subjectivity. The requirement within AR to make the rationale for such decisions explicit is seen as a strength (Levin 2012).

There are other qualitative methods of research besides AR that involve immersion of the researcher in the lives of the participants, such as ethnographic observational studies, where the purpose is to study the participants in their natural environment with as little change to natural behaviour as possible. By contrast, in AR the researcher has an active role in collaboration with participants to facilitate change; the researcher is therefore change agent, observer and participant (Reason and Bradbury 2009).

As indicated earlier the involvement of the researcher in AR can vary; s/he may be involved in the entire process or only some of it. When the researcher is in pursuit of a higher degree, s/he will be fully involved in all cycles but the participants may have varying degrees of involvement through the differing cycles (Coghlan and Brannick 2014). In describing AR conducted for doctoral study, the researcher may work as an individual, rather than within a group/community in the initial and final cycles of research (Coghlan and Brannick 2014). It may be that, notwithstanding the involvement of the group in the core AR cycles, the first and last cycles would be more reflective of individual practitioner enquiry (McNiff 2013a; Baumfield et al 2013). Reflecting on AR in organisation, Levin (2012) argues that role distinction is useful even though the researcher is deeply involved

in the process, advocating that the organisation decides on and runs the actions, while the researcher focuses on sound data collection. This stance seems to assume that the researcher is not part of the organisation. In contrast, McNiff (2013a), amongst others, describe a completely embedded researcher model, in which the researcher is responsible with other participants for the action and the research process. McNiff (*ibid*) argues that the researcher instead presents a critical reflection of the effect of their personal philosophical stance on the study design, action and analysis of the data; the reflexivity contributing to the validity of the process as previously described.

In section 10.1.1, I described my stance as being somewhat hybrid. I started Phase 2 with a predominantly post-positivist view of AR based on Davison et al (2004) and Chiasson et al (2008). I acknowledged that, although I felt just as much a lymphoedema specialist as my peers and was aspiring to a fully democratic process, my position as academic researcher and the person who had previously set up a website for the group predicated some assumptions of outside-ness. The conduct of the study and my positioning through the different cycles of Phase 2 and the questions asked, reflected the critical consciousness I felt regarding my role throughout. This will be discussed in greater detail as I present findings of the AR cycles and at the end of this thesis.

10.3.2 Ethical issues in action research

Based on beneficence, respect and justice, the core ethical considerations in AR are common to all research approaches. However, the ‘insider’ approach and flexibility of AR necessitates additional considerations (Coghlan and Casey 2001; Holian and Coghlan 2013). These include:

- Power, reciprocity, co-reliance, the dual role of the researcher
- Confidentiality
- Informed consent
- Political intent
- Effect on researcher

Issues of power can be complex when the researcher is embedded in the dual roles of participant and researcher (Holian and Coghlan 2013). The notion of

equalising power through reciprocity, where researcher and other participants gain equally from the activity, is an aim but cannot be presumed (Maiter, Simich, Jacobson, Wise 2008). As the research moves through various stages there may be times when a dependency on the researcher is created, particularly if a consultative/expert role has been taken on e.g. web design (McKay and Marshall 2001). O'Brien (1998) asserts that the main role of the AR practitioner should be to empower the local leaders so that they can take responsibility for the process. This can cause a dilemma for researchers if they feel they need to maintain control over the project to meet particular criteria, such as when the research is in pursuit of external academic qualification (Herr and Anderson 2015). Academic standards can pull the researcher away from more responsive 'indigenous' acts (Eikeland 2006) but they could also add rigour and a theoretical perspective that may not have been considered in a pure service development initiative.

In AR the open, democratic style may lead to participants discussing confidential data without realising boundaries are being crossed; and during data analysis or reporting other participants may be able to work out the source of an utterance (Coghlan and Shani 2005). In addition, as progress and outcomes of a study are unpredictable informed consent needs to be a continuous process. The participants must have a clear understanding of how AR works, and be encouraged to discuss changes; as with other modes of research participants must feel able to withdraw at any time. In this particular study the participants were reminded of this option at the start of every meeting and interview, and the Programme Manual (Appendix 19) was used as a prompt to discuss process changes.

All research could be said to be political but in AR where there is explicit intent to change practice, issues of power can be enabling or disabling between researchers and researched. The differences in power can be subtle and complex (Dillon 2014). Coghlan and Shani (2005) warned that the researcher as change agent must guard against misrepresentation and collusion, manipulation and coercion, and conflicts of values and goals. Of particular relevance to this study was a potential power imbalance between myself and my peers because of their perception of my previous experience of using technology and web development, and their perceptions of academic requirements. Field notes would prove to be particularly relevant so that ambiguities could be identified and addressed honestly.

Finally the effect on the researcher of being embedded in a dual role produces ethical considerations (Holian and Coghlan 2013). Safeguards needed to be built into the design of the study against perceptions of dependency on the researcher. In addition, I identified in this study with many of the issues raised by Holian and Coghlan (*ibid*): the dilemma of time spent on the project cycle versus time spent on the research cycle, of presenting oneself as principally a practitioner or as a researcher, and feelings of using colleagues' time for personal benefit (academic qualification).

How the ethical issues were addressed in this study is elaborated in section 10.4.2 below.

10.3.3 Data collection methods in action research

The methods used within AR are not exclusive to the approach but typically used are the reflexive diary, field notes, organisational (or community) process documents, interview recordings and transcripts, and in more recent studies, multi-media such as video and web technology (Coghlan and Brannick 2014; Herr and Anderson 2005).

The reflexive diary is used by the researcher to reflect on the influence of underlying and contextual theories; it is a type of self-ethnography (Coffey 1999). In this study the reflexive diary was a useful prompt for discussion with academic supervisors and other experienced researchers. This would prompt cycles of exploration of a wide array of literature regarding possible influencing theories followed by more discussion. This varied from articles which challenged my epistemic positionality (Basseches 2005) to articles which caused me to question my assumptions regarding creating better engagement with online forums (Yates, Wagner, Majchrzak 2010); these will be discussed during the cycles. In this way it reflected the personal practitioner enquiry previously described.

Field notes may be written in the presence of other participants or immediately after meetings/interviews or during data analysis. This may depend upon the perceived/agreed role of the researcher along a continuum between 'participant - observer' and 'observer-participant' (Gold 1958). They may be useful to reflect not only observed behaviours but also initial impressions, emotions and early

interpretations (Kawulich 2005). The degree to which behaviour is natural when people are observed is contended (Johnson and Sackett 1998). However, unlike traditional anthropology, in AR the researcher is a participant with the intention of influencing proceedings; the data would not be described as naturalistic but a product of intervention. The field notes may also include some analysis of the influence of the researcher and feed into a reflexive diary.

In this study field notes were written immediately after each SLPN meeting, in real-time during smaller subgroup meetings and both during and after interviews. In addition, briefer field notes in the form of memos would supplement transcriptions and process documents. My aim was to write field notes quickly and without overt self-analysis so that later reflection might expose assumptions or bias and help my process of reflexivity. For this reason, field notes remained private to me in their raw form but could be useful in data analysis. For example, when my interpretation of data was being fed back to the SLPN group for dialectical analysis, we could compare my initial impression from field notes with my more considered interpretation and rationale, and then with the group's interpretation.

Since one of the main aims of AR is to produce change, process documents and logs become useful data sources and can demonstrate key decision points and the factors that influenced them (Coghlan and Brannick 2014). It is recognised that process documents are not politically neutral and will reflect a relationship between the recorder and the audience. What is recorded and how it is recorded may therefore represent underlying agendas or assumptions. In this study the minutes of meetings were one such example, where a secretary recorded proceedings as a record and to convey decisions to non-attendees. Another form of process document in this study was the e-mail communication between subgroup members. This informal communication had the potential to expose frustrations and elations within the working subgroups, which may be significant to the overall process and was therefore recorded and included in the analysis.

One of the premises of AR is that those involved in the social situation have valuable knowledge about the situation and may have ideas about possible solutions (Lewin 1946, 1951; Elliot 1991; Goldkuhl 2012). As these people are likely to be most aware of the effects of the research as it is occurring, interviews

with them can be a useful way for the researcher to capture these types of data. The underlying assumptions of interviews (individual or group) can be either relational or as transparent gateways to their experiences (Mauthner and Doucet 2003). That is, the interviewees' utterances can be interpreted as being related to the social context (including the interviewer) so socially constructed, or can be interpreted as being their individual view or experience of a phenomenon.

In this study a mixture of group and individual interviews were used. The underlying assumption was of social construction in that even as they described their experience it was being compared and contextualised in relation to others in the study. A style of convergent interviewing based on Dick (1998) was used which aimed, not at creating a consensus of experience, but to explore the differences and the social context influences.

Think-aloud technique was considered in this study for the end-users evaluating the OLR to give feedback into the development cycles. It is a cross-over between observation and interview, in which the participant speaks their thoughts as they undertake an action (Farrimond et al 2006). The method was recognised as a potentially rich source of detailed information on using online resources. However, a concern was that it created an unnatural context for the HCP; observation could potentially change their behaviour (Cotton and Gresty 2005). Letting HCP end-users test the OLR in their own work context, at a time that suited them, was considered more practical and natural. This would then be followed immediately by a pre-arranged telephone interview. Notwithstanding the advantages of real-time reporting advocated by Cotton and Gresty (2005) it was hoped that the immediacy of the interview meant first impressions and frustrations could be captured.

Multi-media and web-technology give the possibility of capturing new types of data for AR (Whitehead 2010) and of remotely logging online activity e.g. Google analytics to record online activity. The latter says nothing of the reasons or meanings behind the activity, but such information can be useful in denoting some sense of the utility or value of an OLR. For example, in simplistic terms highly accessed resources are generally taken to imply their value to the target audience. However, such figures should be accepted critically and with awareness

of the effects of algorithms of online recommendation systems (Bobadilla, Ortega, Hernando, et al 2013).

In this study I set up Google Analytics for the OLR developed, in response to data from the SLPN participants that this information would be important to their engagement with the development process; this will be discussed in Cycle 4, an example report is given in Appendix 11.

10.3.4 Multiple data sources in action research

As discussed in Phase 1, combining data seen as originating from different ontological roots has been viewed as problematic and analysis must be done with respect to the rigour due to each individually (Parahoo 2006; Al-Hamdan and Anthony 2010). The multiple sources of data typical of AR give a flexibility of approach that is useful in a dynamic situation. It allows different collaborators to contribute in different ways and for the methods most appropriate to the stage of the process to be used (Abraham and Purkayasha 2011). One of the strengths of a multiple data source approach is that triangulation of data can give a broader explanation of a situation which may enhance the analysis phase and thereby the planning for the next action cycle. However issues of data dominance may arise. Miller and Fredericks (2006) present an argument for dominance of quantitative over qualitative data, but there seems to be no discussion in the literature about dominance of a specific source of qualitative data within a single methodology. In AR there must be a process for decision-making where there are divergent, conflicting data and, indeed, whether this is a community decision or the researcher's decision to make. The divergent ideas can be a crucial part of the research where the techniques incorporate convergent interviewing (Dick 1998), and dialectic analysis (Waterman, Webb and Williams 1995). Ultimately, evaluation, decision-making and planning the next cycle relate to the ownership of the knowledge and role of the researcher as discussed earlier. Another challenge in using multiple data sources can be the process of data analysis, in that the quantity may be vast and dealing with different types of data can be complex and overwhelming; particularly if the researcher is principally a practitioner who is new to research (such as in the practitioner-researcher model of AR). Although there is software which make qualitative data management and analysis more manageable e.g. NVivo, the underlying approach to data handling,

(what is combined, separated, selected or discarded) remains a decision the researcher must make (Guest, MacQueen and Namey 2012).

In this study a vast quantity of data was produced and, although I learnt to use NVivo, I was more comfortable ultimately with my own data organisation and meta-data system. Details of how data were organised and which data took priority during different AR cycles are described in greater detail in the Study Design chapter (section 11).

10.3.5 Data analysis in action research

There are no methods of data analysis that are unique to AR. Although the dialectical approaches mentioned above may be particularly relevant, the methods of broader qualitative data analysis are commonly used. In this brief review of data analysis approaches and methods I acknowledged my initial stance of post-positivism from Phase 1 by the explicit inclusion of data analysis methods that linked post-positivism and AR, but I broadened my considerations with historical qualitative data analysis methods.

One of the unique requirements of AR is that the data analysis must be rapid enough to feed into the next AR cycle, whilst the same time maintaining rigour. The line-by-line analysis typical of classical grounded theory (GT) requires a time input, and level of experience and theoretical sensitivity (Glaser and Strauss 1967; Kelle 2005) which the participants in this study (as HCPs) would not have had. Dick (2007) argued that AR could learn from GT but acknowledged that modification was likely in practice. The emphasis in classical GT for the development of theory may not be the main focus of AR, rather the mutual construction of knowledge with an acknowledgement of study context (or social reality). In this aspect Charmaz' Constructivist GT has a closer alignment (Charmaz 2000). Whilst still claiming to use GT, Charmaz adapts and advances the constant comparison technique and highlights that this can be used within other methods.

An issue not explicitly addressed in the above literature is the existing conceptual frameworks in operation within a group participating in AR. Raymer (2009) presents the case for concept mapping using a logic framework to make explicit

the underlying theories of a programme. Components of a logic framework vary but commonly include a chronological form of context/assumptions, resources, inputs, activities, outputs, outcomes and impact (adapted from Kellogg Foundation 2004). I chose to use these constructs within framework analysis since this was familiar to me and it seemed useful for making explicit the conceptual frameworks initially at play.

In the first cycle of Phase 2 we therefore used a framework method of analysis (Ritchie and Lewis 2003) which is arguably easier to explain to participants although not an easy option to conduct (Gale, Heath, Cameron et al 2013). The framework method sits within the family of methods termed Thematic Analysis or Qualitative Content Analysis and focusses on the commonalities and differences in the data before describing relationships between parts of the data. Using a matrix output, data can be compared within cases (data items or individuals) or across cases. The aim is to produce explanatory conclusions. The framework method supposes pre-existing themes or categories for data, which may have emerged from theory and/or previous studies (Ritchie and Lewis 2003) or as in this study, an earlier phase. Such limits may be an asset in creating a manageable boundary around a large amount of data and where the research question is specific but there is a danger of only seeing what is being sought. Where the question is more exploratory such an approach might miss unexpected or novel results and therefore the researcher would have to be actively looking at data which do *not* fit, as much as those which fit the framework. Guest et al (2012) add that the method may not suit highly heterogeneous data; the data must cover similar topics or key issues in order to be categorised consistently.

Consistent with the requirement in AR to make my assumptions explicit, initial qualitative data analysis employed the framework approach. Later, as afforded by the flexibility of AR, and as demanded by the nature of the emergent research questions, I employed thematic analysis.

Thematic Analysis is described by some as just another method of qualitative analysis (Ryan and Bernard 2000) and by others as a methodology in its own right (Braun and Clarke 2006). For this study I considered it the former. It involves searching across a dataset to find patterns of meaning. Themes may be data-driven (i.e. inductive) or theory-driven, and in analysis the data can be taken 'as

is' (such as in semantic analysis) or interpreted for the meaning behind the discourse, (such as in thematic discourse analysis) (Braun and Clarke 2006). The timing of the literature review depends on which approach is taken and whether the researcher needs to be sensitised to likely themes, or is aiming for a more inductive approach.

In this doctoral study, where the question was whether the process of OLR development could be modelled, there were different lenses through which it could be viewed, one being the practical physical components and people participating, and what actions were undertaken in the process; another being social, cognitive and emotional views, where the rationale for decisions would be the focus. Reflecting my earlier stated hybrid stance, my perspective was that these were likely to be inter-related for a process to occur; therefore data analysis that could take account of both perspectives would give a fuller explanation.

The specific details of the data analysis methods used in Phase 2 will be described further in Section 11.4.5.

10.4 The use of action research in this study

Reflecting the characteristics of AR listed in section 10.2.1, the characteristics of the study which make AR applicable in this doctoral study were:

- I was able to work within the community to enable an embedded method
- The participants (the LSs) identified a problem (an education need) for which they had little empirical evidence
- A change intervention was required to meet this identified need
- Collaboration between practitioners would be required in order to achieve national cohesion/consistency

- The participants (the LSs) had the intention to improve both their situation and their on-line education skills and knowledge
- There was no model for this way of developing an OLR therefore there was a need for the flexibility within the process to be responsive to ongoing findings
- The iterative cycles would allow for learning and development from each cycle to inform the next
- Finally, in relation to creating new knowledge which may inform theory - there are other small specialities, like lymphoedema, so the development of a model may inform related education theory.

10.4.1 How validity is addressed in this study

Validity, or trustworthiness, of the AR approach comes from the involvement by those most greatly affected by a problem; find meaningful solutions from their involvement in definition of the problem, implementation of action and evaluation of iterative cycles. This is underpinned by the reflexivity of the researcher and by an overt expectation of peer evaluation, usually before publication, by critical friends (McNiff 2013a).

Trustworthiness is addressed in this study by immediate involvement of the LSs in defining and working to find a solution to the problem; and the implementation of action-in-process, followed by subgroup and my reflection being put to group evaluation in iterative cycles. In addition my reflexivity is made explicit from the initial iteration of the research questions, through data analysis, to discussion of findings; and it has undergone peer evaluation beyond that of the participants, by presentation to and discussion with academic peers, and preparation for publication.

10.4.2 How ethical issues were addressed in this study

Based on recommendations by Winter (1996), O'Brien (1998), and the issues discussed in section 10.3.2 above, the following measures were incorporated into this study:

- At the outset, all stakeholders were consulted and guiding principles were agreed on confidentiality, an acceptance of a fluctuating reciprocity/power, and an explanation of the unpredictability of the course of the study.
- I made clear the purpose of the research as distinct from the action/project cycle.
- Throughout the study, participants were made aware of which data sources were being used. Permission for access to, and use of, documents was given initially and checked at intervals.
- Although not directly involved in analysis of raw data, participants were given the opportunity at each stage to comment on my interpretations and given opportunities for dialectical analysis.
- Descriptions of the work within subgroups were self-reported to the larger group. Before publication the descriptions of the work of the group will be discussed and negotiated.
- Decisions about the direction of the research were collective, notwithstanding my influence as researcher, and any requirements I had for academic purposes were openly discussed.
- The design of the project allowed participation by all who wished, and allowed for the involvement of those who wished to participate in the OLR development without their data being used.
- Arrangements for dealing with disagreements or conflicts were agreed.
- Opportunity was given to discuss participants' expectations of me as researcher, and also their roles, and the progress of the study was reported at each cycle.
- External technical expertise was sought on an ad hoc basis at no cost.
- As researcher, I used a combination of project management tools, academic and personal support systems, and open discussion with the participants, to address and prevent some of the issues identified here.

10.5 Summary of chapter

This chapter clarified the stance taken, the rationale in relation to the methodological aspects pertaining to data management and, finally, how trustworthiness and ethics were addressed. This rationale will now be taken forward into the Study Design.

11 STUDY DESIGN

11.1 Introduction

As described in chapter 10, actions and findings are intertwined within the AR approach. This chapter explains the overall design of Phase 2, while chapter 12 describes the five AR cycles and in presenting the findings some further details of the research methods will be explicated.

This chapter describes the reconnaissance and collaborative planning, the process of gaining ethical approval, then the study design. I will explain how flexibility was accommodated; the timing of the AR cycles; the participants and their roles; data sources, organisation and storage; and the specifics of addressing fidelity and rigour. The chapter concludes with an explanation of how the selected data analysis approaches were applied within this study.

11.2 Reconnaissance and collaborative planning

The period preceding group agreement of Phase 2 and collective planning to develop an OLR to meet the identified education need of Phase 1 was described previously (Chapter 8). Members were aware that this would be carried out as part of my higher degree, subject to ethical approval. There was then a period of reconnaissance where I explored with SLPN members the technical possibilities within their workplaces. SLPN members work in independent hospices, NHS hospitals, and community services where remote technology may be used. Testing included the acceptability of different software to their IT governance units and accessibility in relation to workplace firewalls (software systems that prevent unauthorised access to computer networks). The latter was important, not only so that potential study participants would be able to access our online work during development but also so that HCP end-users would ultimately be able to access the OLR from workplace settings. During this time members contacted their technical support team to discuss the proposed project, hence establishing their current level of local resources. This period also gave an opportunity for participants to consider their level of involvement and discuss this with their managers. It gave me an opportunity to get an impression of the current level of experience within the group of any website (or similar) development and the level of interest and enthusiasm. I was cognisant that the identification of early

adopters (Rogers 2003) and champions (Kotter 1996) would help the initial stages of the work. Similarly, drawing on literature from organisational development, education and AR, Kenny (2003) describes a research-based model for managing strategic educational change and innovation projects. The model differs from this study in that it assumes a top-down approach and additional project funding, however Kenny highlights the importance of this pre-project time. The time allows for contemplations of alignment of organisational, project and personal goals and for learning conversations which 'provide opportunities for the social construction necessary to adopt an innovation, while at the same time addressing the requirements for changing educational practice' (Kenny 2003, p5).

By December 2012 we had a project plan based on discussions around OLR development which had included explanations of software development process models, e.g. waterfall methods, spiral designs and prototyping (cyclical feedback) (Floyd 1984). My peers could refer to these models on open access sources such as Wikipedia (https://en.wikipedia.org/wiki/Software_development_process). Our plan was that subgroups would be formed to work on specific areas of the OLR. The output would be reviewed, initially within the subgroup, then inter-subgroup, and finally by potential HCP end-users. From this core concept I was able to work up to a study design acceptable for academic submission and this was submitted for ethical approval and regional health board clinical governance approval.

11.3 Ethical approval

The application for ethical approval for Phase 2 was based on the study involving HCPs who either worked for the NHS Scotland or provided services for the NHS in Scotland (e.g. hospice staff and GPs). Of particular note was that no patients would be involved in this study.

The considered opinion on the need for NHS approvals of the relevant managers of the regional NHS Research Ethics Service and NHS Research and Development was sought. Both responded that it did not require NHS approvals as it fell outside their remit as described in GAfREC (Governance Arrangements for Research Ethics Committees 2011). However, ethical approval was sought and gained from the Medical, Veterinary and Life Sciences College Ethics Committee, University of Glasgow on 27th February 2013 with the provisional project title of: Developing a model for producing an educational resource for health care professionals: an

exploration of the processes involved. Project No: 200120009 (Appendix 9). Additionally, the clinical governance/service development departments of each health board were contacted in order to register the project, where required. Contact details of those giving confirmation of notification/registration and the dates received were recorded in the study site file which was stored electronically at the university as the official base of the research (Appendix 9).

11.4 Study design

11.4.1 Planning for flexibility and the timing of cycles

As AR is an evolving process it is accepted that, although there is an initial plan this may change iteratively. With SLPN I devised a broad programme manual, as one might in evaluating an intervention, as a possible means of identifying points of departure from the initial visualised plan (Mowbray, Holter, Teague, et al 2003). The initial programme formed the basis for the application for ethical approval and for written participant information. However, consent is a continuous process within AR, (section 10.3.2), precisely because the study changes as it progresses; and further ethical approval is sometimes required. The opinion of the ethics committee was sought at the mid-point of the study in relation to a request by two participants to be interviewed together, rather than individually as planned (P12 and P15 in Cycle 3, see section 12.3). Otherwise changes were able to be accommodated within the given approvals. Fidelity to the programme manual and to the requirements of the AR process were monitored explicitly mid-study, (see 11.4.4).

The study was designed to fit within the existing cycle of three SLPN meetings per annum, in March, July and November. Thus there were 5 cycles over an 18 month period of OLR development and data collection from March 2013 to September 2014. Explicit timings are given in Table 11.4-1.

Table 11.4-1 Phase 2 design and timeline

Research cycles	1: March 2013	2: June 2013	3: Nov 2013	4: March 2014	5: June 2014	Sept 2014
Action cycle activity	Subgroups forming, training, planning.	Create/build OLR frame	OLR content and layout refinement	OLR content and layout refinement	OLR content refinement	Project sustainable.
Feedback on OLR and end user interviews	Intra-subgroup	Intra and inter-subgroup	Intra and inter-subgroup	End-user interviews and feedback (n=6)	End-user interviews and feedback (n=10)	
Data items	Meeting records, field notes and research log, and e-mails		As previous; plus participant interviews and fidelity check.			
Data analysis by:	Researcher only	Researcher and group	Researcher and group	Researcher and group	Researcher only	
Analysis method	Framework	Framework and Thematic	Thematic analysis and dialectic analysis	Thematic analysis and dialectic analysis	Thematic analysis and dialectic analysis	
SLPN Participant Interviews			Subgroup and non-subgroup members (n=6)		Subgroup only (n=4)	Subgroup and non-subgroup (n=8)
Fidelity monitoring	Informal at each meeting and subgroup meeting			Formal fidelity check whole group		

11.4.2 Participant recruitment and their roles

Membership of the SLPN was described in section 1.3. SLPN members were given the opportunity to participate either within a subgroup, designing content and building pages of the OLR (Subgroup Participant Information Sheet, Appendix 12), or as part of the main group who would participate only within the main meetings (Non-subgroup Participant Information Sheet, Appendix 13). In addition, members could participate without their individual data being used, or not participate at all. However I clarified that since the research was studying group activity, factors or persons affecting group activity would need explaining, but that if possible this would be done in a generic way; this was accepted. In practice, all participants agreed for their data to be used.

We had envisaged 4 subgroups of 3 people, plus myself. In the event there were 3 subgroups of 4 people. These comprised one subgroup to develop the OLR pages for GPs (GP subgroup), one for the community/district nurses pages (DN subgroup) and one for the resources aimed at the LS themselves i.e. for their peers in the SLPN (LS subgroup). The rationale for selecting these groups will be given in the description of Cycle 1 (13.1). I planned to work within each of the subgroups to gain an insider perspective of how they worked.

Subgroups could arrange extra face-to-face meetings and/or work virtually but the basic premise was to work within currently available resources as far as was possible. At each SLPN meeting the subgroups fed back progress to the main group, shared any developed resources and sought opinions which fed into the next cycle of work.

After two cycles of resource development the OLR was ready for end-user testing. This principle was the same for all three subgroups. Members identified and made initial contact with potential HCP end-users (i.e. GPs, community nurses or LS) and one SLPN member who was not part of a subgroup. With agreement I then sent potential end-users study information and details of the consent process (End-user Participant Information Sheet, Appendix 14). This was followed by a telephone call to check they had received the information, and to answer any queries and arrange a suitable date for interview. These interviews could be face-to-face but in practice all end-users selected telephone interviews.

End-users were asked to evaluate the pages of the OLR relevant to their profession and were then interviewed. In the case of the SLPN members invited to evaluate the GP or nurse pages, the interview questions were focussed on whether or not the OLR pages were suitable for the profession targeted. I conducted the interviews myself rather than ask the subgroup member who had identified the end-user, for two reasons. I could not assume that SLPN members had either the experience or the time to conduct research interviews and that the end-user might feel they could not be too critical to the SLPN member who had identified them for the study in the first place. In the interest of veracity I made clear to participating end-users that I was also involved in the development of the OLR but that I would feed back their anonymous evaluation in an objective manner.

The initial plan was that I would interview up to 4 end-users per subgroup in the 3rd and 4th AR cycles, then collate and make anonymous the responses before feeding them back to the appropriate subgroup. In practice end-user interviews spanned three cycles in two lots (see Table 11.4-1). In each lot, I interviewed two doctors and an SLPN member regarding the GP OLR, and two community nurses and an SLPN member regarding the DN OLR. As can be seen from table 11.4.1 the end-user interviews which should have occurred in Cycle 3 overran into Cycle 4, which then meant that the subsequent end-user feedback did not happen until Cycle 5. For the LS OLR pages, only one cycle of interviews occurred because the LS subgroup members were later than the other subgroups in getting their training and building their OLR pages. This will be explained further in the next chapter. This is a good example of the flexibility required within AR i.e. to build in an evaluation and feedback process outside of pre-set meeting times and anticipated cycles. It is also an example of the multiple asynchronous cycles that can occur in AR and the importance of following through the cycles whenever they occur (McNiff 2013a, Coughlan and Brannick 2014, Herr and Anderson 2005).

11.4.3 Data sources, organisation and storage

The study would produce a large and potentially unwieldy dataset. I recognised that effective data management was important to enable me to move back and forth between the raw data and the analytic processes. Much of the data would

intertwine as cycles progressed so I had to secure clarity of sources to ensure the integrity of the subsequent stages and the research findings themselves (Miles and Huberman 1994; Herr and Anderson 2015).

The data sources analysed in each AR cycle are reported within each cycle in chapter 12. In addition, it was envisaged that fidelity documentation may provide supplementary data. Each data item was given a coded file name and version control information; participants were given an identifier code, e.g. P12, and identifying meta-data documents were kept separately.

Broadly, a dataset included any data that had occurred within a given chronological cycle. However, as will be described in the data analysis, comparisons were made across datasets later in the study creating a cumulative effect.

Five SLPN meetings occurred during the data collection period (March 2013 - September 2014). A section of each meeting was given to development of the OLR; this was the only part of the meeting audio recorded. Where other business on the agenda had a direct impact on the study this was recorded in field notes and in memos to the minutes. I transcribed the audio recording myself, introducing line numbers as reference points, a list of those present and memos to clarify context or where non-verbal communication had occurred e.g. the directing of a question/comment towards one individual or towards documentation. The participants present at the meeting were given the opportunity to check the veracity of the transcription and add any clarifying comments. Member checking or validation can be done for different reasons (Guest et al 2012). In this particular study it was done as much to reassure the SLPN participants (as co-researchers) that the raw material of analysis was correctly recorded, as it was for credibility of the subsequently analysed data (Lincoln and Guba 1985). Identifying features such as names or specific locations were then coded to make these anonymous.

Supplementary to the transcript of the recorded section of each SLPN meeting, I wrote a field note immediately after the meeting and this was similarly coded. Other documents supplementary to each SLPN meeting were Subgroup Feedback

Sheets (Appendices 15 and 22). These were completed by subgroup members, before the SLPN meeting, as a record of what subgroup representatives intended saying to the rest of the SLPN members about their progress, and recorded the feedback they were given. The majority of this information was captured in the audio recording but there was the potential for a difference between what was intended and what was said, which could then have been explored with the subgroup representative. Similarly, in theory, the formal meeting minutes would record a summary of the audio recording but the conciseness of the minutes written by the group secretary meant that only an essence was captured and sent out to non-attendees. The minutes, in reality, captured how the study was being reported to those not present at the meetings. The pre-study and within-study level of communication was something that was explored in interviews with SLPN members, in relation to the sense of belonging, particularly with those who could not attend the meetings.

Subgroup meetings were held between each SLPN meeting. For the DN subgroup, whose members were mostly co-located, these meetings were frequent and therefore I would only attend occasionally and they kept their own activity and reflection log. For the more dispersed subgroups there were fewer face-to-face meetings and I was more likely to be present. A meeting summary would be shared between us after the meeting for information/agreement, and if I had been present I wrote personal field notes immediately afterwards.

Throughout the data collection period I was copied into OLR related e-mail communications and, with member permissions, these were copied to text documents per subgroup, per cycle, for analysis. As the information was transferred it was coded for anonymity.

The research diary (RD) which I kept throughout this period was dated per entry rather than by line numbers and was analysed per cycle as with the datasets above. Additional memos would be added and dated in columns as I periodically reflected on the content.

The decision to use individual interviews was based on the recognition that much of the other data would, directly or indirectly, be group communications, bound

up with the social norms of the group and existing relationships within it. An opportunity for the participant to speak as an individual might provide an alternative perspective or interpretation of the situation. Individual interviews are also a social interaction, but in this case between the researcher and the interviewee, so different social expectations and power relationships may exist. The interviewee does not have the anonymity of a survey response but may feel more able to express their views to one person than to an open group. In this study I had to consider how I could maintain that anonymity when the data were discussed with the larger group e.g. keeping interview dates confidential. As with much of the data, the interview data are in relation to the particular context and therefore refers to a moment in time. The perspectives of different individuals at different times therefore could not be synthesised into one meaning, but anonymised views could be useful prompts for subsequent discussion with the larger group in terms of 'fit' of the experience.

Interviews were conducted with cognisance of guidelines for interviews given by Cohen et al (2011, p425). Since the participants are my peers, the interviews took a conversational form, but used a template to provide structure and ensure certain themes were included. The interviews were conducted in person whenever possible, so that I could remain sensitive to body language as well as the spoken word. Even when participants were working in geographically-remote clinics, we would try to arrange interviews to coincide with central meetings if possible. However, where face-to-face meeting would cause disruption to work, incur additional costs for the participant, or was not their stated preference, the interviews were conducted by telephone. Some participants may have found it easier to discuss some things without being face-to-face (Harvey 1988) although the nature of the interviews was not anticipated to be sensitive. Telephone interviews for the evaluation of the OLR were in keeping with the precept of the development being within current resources, reflecting the contemporary NHS Scotland culture of an asset-based approach (NHS Health Scotland 2011).

A semi-structured approach to interviewing was used and fluid interview structure was considered appropriate, given there were some things we knew we wanted to explore but the fluidity allowed for new issues to emerge (Lincoln and Guba 1985). Some questions remained unchanged between interviewees but others

would evolve depending on the AR cycle in which the participants were interviewed. This can be seen for example in differences between version 1.0 (dated December 2013) and version 2.0 (dated May 2014) of the Semi-structured Interview Template for subgroup members (Appendix 16). A different template was used for interviewing non-subgroup members; similarly, this evolved as the study progressed (v1.0 and v2.0, Appendix 17).

The interviews were recorded and I transcribed each within 48 hours of interview. Each interviewee was sent a copy for an opportunity to comment on the accuracy of the transcription and make any clarifying comments. The process is subject to memory differences and contextual bias in opinions, but by transcribing and returning the data very quickly, I hoped this effect would be minimised. The process of member-checking was contested as means of increasing reliability of qualitative data by Sandelowski (1993) who gave a number of reasons why the process may paradoxically reduce rigour e.g. the self-interest of individual agenda. However, much of the criticism of member-checking assumes an interpretation of the data is included. In this study the members were simply checking the accuracy of transcribed raw data with, at the most, a memo asking for clarification if a section was unclear e.g. “which group did you mean here, the subgroup or SLPN as a whole?” In practice, few participants made changes or added comments to transcripts. I acknowledge this may have been due to a wish to be compliant research participants, a wish to avoid conflict, disinterest or time pressures. This was not specifically explored with participants in a balanced judgement between respecting their busy schedules and that they would have opportunity again to comment when the analysis of their interview was synthesised with others in end-of-cycle group discussions. That is, my synthesised interpretations underwent whole group dialectical discussion at the end-of-cycle but this was principally intended as an opportunity to evaluate the process of OLR development, rather than member validation.

The exceptions to the above process were the end-user interviews. As described these were all telephone interviews, conducted using a semi-structured questionnaire addressing the usability, acceptability and content of the OLR pages reviewed, and providing an opportunity for participants to make suggestions for increasing awareness of the OLR among their specific profession (Appendix 18).

These end-user interviews were not audio recorded, but hand written notes were taken during the interview and immediately afterwards. Each interviewee was given the opportunity to check the notes, sent by encrypted e-mail, before they were anonymised and collated into the dataset. Each end-user was then asked if they would like to undertake a further review of the OLR at the next development cycle but reminded that they were not under any obligation to do so.

All data were stored in compliance with University of Glasgow security policies and guidance at the time of ethical approval (March 2013); the University has since updated its online guidance (University of Glasgow, 2015).

11.4.4 Fidelity and rigour

The consideration of rigour within the AR approach was discussed in the previous chapter, particularly section 10.4.1. Two specific additional tools were used in this study in order to provide a steering point and to guide discussions around fidelity to the approach taken. They were also acknowledged as potential data sources. The first was a 'programme manual' and the second a 'fidelity to AR approach' document.

The programme manual (Appendix 19) outlined the anticipated format of actions and progress of the study. This was based on my experience and also the literature around small group working on IT projects, then discussed with the SLPN group and accepted as being a good provisional plan. The programme was tabulated so that we could mark off completed steps and make a note of variances to the plan and reasons for the change.

Our Fidelity to AR Approach document, based on Davison et al (2004), used criteria for the AR process which could be easily monitored; see section displayed in Table 11.4-2.

The purpose of these documents was to prompt critical reflection when variances occurred and help make explicit the rigour of this study. They were also useful as ongoing points of reflection and were explicitly used at the end of cycle 3 to facilitate group discussion of the previously-planned approach versus the real-world actions taken (Section 12.3.2).

Table 11.4-2 Section of fidelity to AR approach document

Adapted from Davison et al (2004), five principles for action research:

- 1 Researcher-Group Agreement
- 2 Cyclical Process Model (CPM)
- 3 Principle of Theory
- 4 Change through Action
- 5 Learning through Reflection.

CPM
Entrance > Diagnosis > Action Planning >
Intervention/Action Taking > Evaluation or

1	Researcher-Group Agreement		
1a	Did both the researcher and the specialist practitioners (SLPN) agree that AR was the appropriate approach for the situation?	√	
1b	Was the focus of the research project specified clearly and explicitly?	√	See participant info
1c	Did the SLPN make an explicit commitment to the project?	√	
1d	Were the roles and responsibilities of the researcher and SLPN members specified explicitly?	√	
1e	Were project objectives and evaluation measures specified explicitly?	√	
1f	Were the data collection and analysis methods specified explicitly?	√	

2	Cyclical Process Model (CPM):		
2a	Did the project follow the CPM or justify any deviation from it?		
2b	Did the researcher conduct an independent diagnosis of the situation (education need)?	√	
2c	Were the planned actions based explicitly on the results of the diagnosis?	√	
2d	Were the planned actions implemented and evaluated?	√	
2e	Did the researcher reflect on the outcomes of the intervention?	√	

11.4.5 Data analysis

Although it is not always made explicit, the researcher's lens (or perspective) during data analysis reflects their experience (Miles and Huberman 1994; Dick 2007). In deciding to use the Logic Model (Kellogg Foundation 2004) as an initial framework for analysing the data in this study, I was acknowledging my past work in project management. This experience meant that my natural inclination was to view the initiation of the study through a project structure of Purpose, Context, Inputs, Activities, Outputs, and Impact. I acknowledged in my personal reflection that this did not seem to have much explanatory power in terms of which would be key components, facilitators of and barriers to the process of OLR development, and perhaps more importantly, why so. Therefore I conducted an initial analysis with this framework but remained open to a 'lack of fit' to the framework. That is, I was sensitive to what it told us, and what it missed.

11.4.5.1 Framework analysis

Data from the first cycle were initially analysed deductively using the Logic Model (Kellogg Foundation 2004) as a framework of analysis (Ritchie and Lewis 2003), wherein the framework categories were: Purpose, Context, Inputs, Activities, Outputs, and Impact. As the focus of the first cycle was identifying existing resources and how they might be used, the method seemed appropriate to the research question.

The dataset for cycle 1 (March 2013 - July 2013) were coded for the 6 categories, and then coded again with sub-categories (Table 11.4-3). The addition of an 'other' code allowed for utterances that seemed to be within that category, but did not seem to fit one of the sub-categories. The data for each sub-category were transferred into display tables so that, for example, all the utterances relating to 'Time - within role' could be seen together. Underlining relates to coding of specific word(s), but where the meaning is in the whole utterance, no underlining is shown.

In this way, it was possible for example, to identify that the concept of time within the role of the LS was discussed in several different ways e.g. as commodity - a resource that could be planned but had to be accounted for; as a

barrier; and as a concept that was in relation to skill and knowledge level (Table 11.4-4).

Table 11.4-3 Example of coding using Logic Model categories

Category	Sub-category code	Sub-category	example	source
3: Inputs	3.1.1	Time: within role	<i>trying to meet up and we couldn't manage</i>	P1, SLPN2, 25.06.2013; line 259
	3.1.2	Time: other limits/ opportunities	<i>And then even if we reached the <u>end of the time frame</u> for my research project you've got your way of working then so <u>the project can carry on</u> even if the research bit of it is finished</i>	R, SLPN2, 25.06.2013; line 607
	3.2.1	Funding: internal	<i>We also spoke about videos, and the <u>cost</u> which would be added</i>	P8, SLPN2, 25.06.2013; 625
	3.2.2	Funding: external	<i>I think we've <u>secured [money]</u> for that now</i>	R, SLPN2, 25.06.2013; line 676
	3.3.1	Skill and Knowledge: internal	<i>does an e-mail get sent to people or how do people know that you're looking for advice?</i>	P1, SLPN2, 25.06.2013; line 279
	3.3.2	Skill and Knowledge and information sources: external	<i>I got as far as downloading all the work <u>things that are supposed to help you</u> set it up to talk you though</i>	P6, SLPN2, 25.06.2013; line 292
	3.4.1	Willingness/ attitude: internal	<i>but I'm sure once I know how to do it I'll be better...</i>	P5, SLPN2, 25.06.2013; line 485
	3.4.2	Willingness: external	<i>there's going to be a referral form if we can get someone to help us.</i>	P4, SLPN2, 25.06.2013; line 551
	3.5	other	[none coded]	

Key: P=participant; SLPN2=2nd SLPN meeting.

Table 11.4-4 Example of display of sub-categories for Time

Code	Sub-category	Utterance	Source	Interpretation
sub-category 3.1.1	Time: within role	<i><u>We've blocked a lot of time off in the diary over the next few months so that we need to keep on top it because we need to put down what we've been doing...</u></i>	P8, SLPN2; line 670	Commodity - planned, negotiated, accounted for.
		<i><u>Because everyone was happy we had all agreed to come to XXXXX but then we just couldn't get a date that suited everybody. Either diaries were busy or people were on holiday ...</u></i>	P6, SLPN2; line 393	Time as a barrier
		<i><u>I would just like any wee tips and go over all that again if we had time for that. You know time is of essence and it will take me longer to do it initially</u></i>	P5, SLPN2; line 489	Concept - in relation to learning, skills and knowledge

The findings of the first cycle are presented and interpreted in the next chapter (section 12.1).

The focus in the second cycle was to address the 2nd research question of whether the process of OLR development changed the way the group worked. I anticipated that this might show particularly in coding to the Activities category within the Logic framework.

During the analysis of this second dataset however, I did not feel that framework analysis with the Logic Model was capturing the essence of how the group was working and importantly, changing. Moreover, I found consistency of coding to be problematic; that is, the allocation of sub-categories became unreliable on re-

coding. For example, it was difficult to decide whether a significant conversation was an 'activity' and that a decision might be an 'output' of that activity or whether something was an output only when an object was created, which then missed some of the process. This was crucial to resolve, as the aim of the study was to model the process.

A further example is given below (Table 11.4-5), where one subgroup reports back to SLPN their plans in relation to OLR lay-out. Initially what I interpreted as the main issues were: 4.6 'working off-line on content', and 3.3.1 'personal skills and knowledge (limitations)'. Whereas on second coding I felt the main issue was 4.4 'discussing and sharing ideas' in relation to 1.1 'meeting lymphoedema specialist needs'. Although I accepted that multiple coding was quite appropriate for utterances where more than one idea or phenomenon was being expressed, I was not satisfied with the consistency with which I could apply the codes. The framework coding inconsistencies were discussed with more experienced researchers and some of the participants, with examples of coding.

I reflected on the nature of the research question in the second cycle and those anticipated of the subsequent cycles and concluded that the framework might be constraining my interpretation of the data (Guest et al, 2012; Silverman 2001). I therefore decided to try open coding across the second data set to see if this gave themes that fitted with the interpretation of the participants.

Table 11.4-5 Example of multiple coding

Utterance	Source	1 st coding	2 nd coding
<p>P1: yes we thought we probably <u>put it into subject headings</u> and something you know so we'd find it a wee bit <u>easier to find...</u></p> <p>P6: headings...aha...and then <u>for sharing and giving each other, widening this out a bit, a bit of peer support there as well to help</u>. But its just <u>how to manage it</u>, and as I say the actual lay out we've not looked at yet. We're hoping that will be nice and clear <u>after we've had our training, how we go about it</u>. Is that what everybody.. <u>is everyone quite happy with that?</u> [waits for nods] Good.</p>	<p>P1 and P6, SLPN3;</p> <p>Line 101</p>	<p>4.6</p> <p>3.3.1</p>	<p>4.4</p> <p>1.1</p>
Index of Codes	Code	Category	Subcategory
	4.6	Activity	working off-line on content
	3.3.1	Input	personal skills and knowledge (limitations)
	4.4	Activity	discussing and sharing ideas
	1.1	Purpose	meeting lymphoedema specialist needs

11.4.5.2 Thematic analysis

The process of thematic analysis was described in Chapter 10.3.5. The themes generated, and the consequent interpretation, were compared with that from the previous framework analysis. Many of the main themes were comparable, such as time and learning. However, the thematic analysis seemed to capture issues which I felt had been missed by strict application of the Logic Model framework, such as the consistency of expressed willingness of participants to be involved in

the OLR development despite obvious barriers such as the lack of additional resources. Thus thematic analysis was clearly appropriate.

In subsequent cycles the thematic analysis process was similar, except that I was especially sensitive to different (new) or challenging (disconfirming) themes (Polit and Beck 2010). Transcripts, field notes and memos were colour coded and displayed into themes for ease of tracing back to source for context (e.g. extract of display; Appendix 20).

In the first two datasets the transcripts of the SLPN meetings, field notes and logs from subgroup meetings were the most fruitful data items, with e-mail communication being secondary due to the minimal data they contained. In datasets 3 through 5, the SLPN meeting transcript continued to be a significant source of data, but the interview transcripts also became rich sources of data towards answering the remaining research questions.

The emergent themes will be presented and discussed as they occurred chronologically within the AR cycles, in chapter 12.

11.4.5.3 **Dialectic analysis**

Dialectic analysis is a form of social or cooperative critical analysis (Paul 2012) and in this study it had the potential to facilitate explorations of participants' values, as well as to provide a member-checking function.

A difficulty in introducing the concept of the dialectical analysis to the SLPN was that it could be off-putting if made to sound overly confrontational. The literature on communities of inquiry provides a useful perspective on facilitation of an analytical discussion, rather than mere conversation (e.g. Garner 1995 and Lipman 1991). Initially, it was difficult to facilitate the expression of alternate viewpoints in my peer group. Although it is a democratic group, the SLPN is rarely openly confrontational. The norm is to quietly find common ground; any opposition is likely to be in quiet non-participation. Whilst this may legitimately rise from an aversion to confrontation or from antipathy non-participation stifles a dialectic approach (Noddings 1984). Moreover, the SLPN may have been too homogenous to produce many divergent ideas. As participants came to understand the concept,

the process improved, but alternative viewpoints remained more likely to be raised in individual interviews.

11.4.5.4 **Participation in data analysis**

The data analysis process was continuous throughout all cycles for me, but SLPN members were included in the process whenever opportunity would allow. The most significant group contribution to analysis occurred within SLPN meetings. I would present my provisional interpretation of the data, and divergent interpretations or perspectives were encouraged. The aim of the process was to ascertain the level of perceived 'fit' of my interpretation to the group, and find alternatives, and end up with an evaluation which influenced plans for the next action cycle. For example, in the SLPN meeting at the end of Cycle 2, having identified an emergent theme about the role of the co-ordinator (section 12. 2), I asked the group for their interpretation of my role within the research. Divergent interpretations were given, and by exploring underlying assumptions and reasoning, conclusions were reached which were grounded both in the data and their lived experience (Fontana 2004). This evaluation of my role informed the subsequent cycles and ultimately the model developed (Section 13.5).

In another example, at SLPN4, participants regarded my interpretation of why people were not taking a leadership role within the subgroups, incomplete. It was clear that I needed to look again at the data in relation to alternative theories and perhaps look across several datasets to get a deeper sense of meaning. The process proved rewarding. The ensuing interpretation was agreed to be more meaningful to the group. This will be described in more detail in the findings of Cycle 4, section 12.4.

In addition to the analytical discussions of the SLPN meetings there were sometimes opportunities within subgroups to discuss issues that applied only to them. Provisional interpretations could be compared with the literature and their own reflections and then inform action plans in relation to the OLR design or content. This was particularly effective with the LS subgroup developing the OLR pages for their peers, and examples will be given in the next chapter (e.g. 12.3.3).

11.5 Summary

This chapter described the usefulness of the initial reconnaissance period for checking the feasibility of initial ideas about the approach and study design. The chapter then detailed the number and timing of the action cycles and described the methods for data collection. The rationale was presented for progression of the data analysis technique, from a deductive framework analysis based on the Logic Model to inductive thematic analysis, which will be further explicated as the findings from the AR cycles are described in the next chapter. The use of the dialectic analysis to member-check and to seek alternative interpretations of the data was described.

The next chapter will furnish the details of each of the five AR cycles, by presenting the actions taken and how data were interpreted to produce provisional findings, which informed subsequent cycles and ultimately informed the creation of a model of OLR development (sections 12.4 and 12.5).

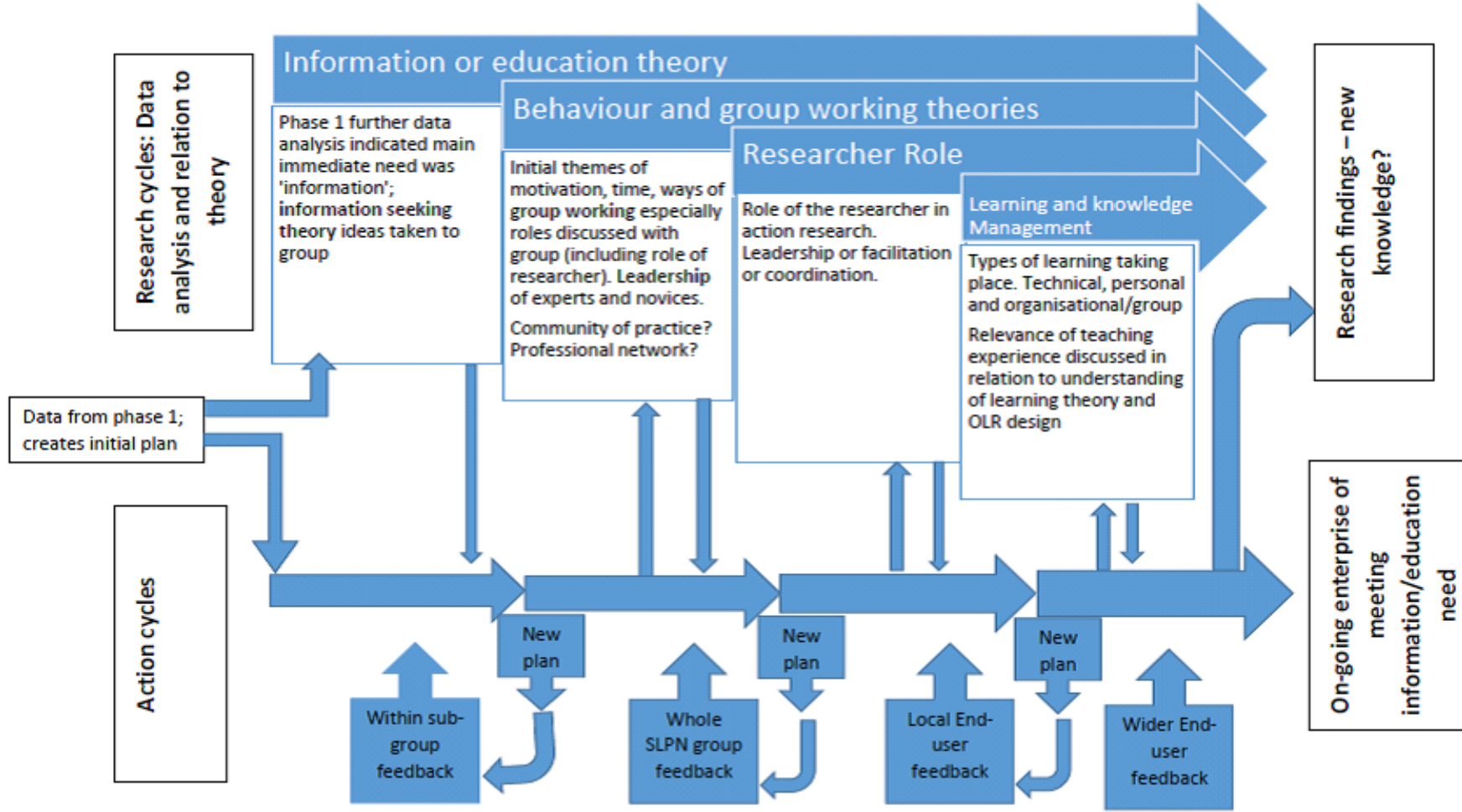
12 FINDINGS OF THE ACTION RESEARCH CYCLES

This chapter presents the findings of five AR cycles and then, in relation to the literature, discusses how these addressed the overall aim of the study and informed the creation of a model of OLR development by HCPs. Each cycle will be reported around a core structure comparative to Susman and Evered (1978) (see Table 12.0-1). However, as McNiff (2013a), Herr and Anderson (2015) and others describe, in reality AR cycles are not as distinct as this structure may suggest. For example, a theme may begin to emerge in one cycle, but not become a major theme until a later cycle. Research questions might not be answered within one cycle and need carrying over into a further cycle with a supplementary question or until more data are available. This was later depicted as per Fig. 12.0-1 which will be revisited in the final thesis discussion (section 13.2). Academic literature rarely shows the messiness of real-world, social research, partly because the vicissitudes, as Bryman (2012) describes them, are often unique to a particular context. The real-life factors that seem to divert or stymie a neat linear progression through a study are not reasons to question the principles of the research but are opportunities to learn (Bryman 2012). In this spirit I present our AR cycles.

Table 11.50-1 Stages of AR cycles in this study

Stages as defined by Susman and Evered (1978)	Stages as defined in this study
Diagnosis - defining a problem	Question driving this cycle
Action planning and alternatives	Planning process
Action taking	Actions taken in OLR development
Evaluation/assessment of consequences	Data collection, analysis and evaluation of AR cycle
Specifying the learning: identifying general findings	Specifying the learning: discussion of extent to which question answered and what new questions are raised
Repeat (define question for next cycle)	Question to address in next cycle

Figure 12.0-1 Interwoven cycles of action and research



PHASE 2 Findings of the action cycles

12.1 Cycle 1 March 2013 – June 2013

12.1.1 Question driving this cycle

The first cycle started at an SLPN meeting (12.03.2015), hereafter referred to as SLPN1, with group agreement of its overall research aim: to explore the processes involved in developing an OLR, within the existing infrastructure, to meet identified educational needs of health professionals, with a view to developing a model that could inform other groups (SLPN1 minutes). Consistent with the AR research methodology, the specific research questions, as defined in Chapter 8, developed over time (Herr and Anderson 2015). A rational starting point for this first cycle was agreed to be:

What are the existing expertise and resources, and how might these be utilised to develop an online learning resource to meet identified educational needs?

Although we, the SLPN, thought we knew the resources available to us we were wary of making assumptions. A presumed familiarity with context can be a particular issue when conducting insider research (Coghlan and Casey 2001) and in longstanding professional networks or CoP (Roberts 2006). In any case, the level of IT expertise amongst us was unknown although, as described in chapter 11, I had gained some insight from discussions during the reconnaissance stage.

12.1.2 Planning process

At SLPN1 eight members were present and, based on participant information which had been sent out to all members over a week previously (Appendix 13), those attending consented to participate in the study. Consent from other members was gained over the subsequent weeks. Based on my reconnaissance we agreed an interim way of working (Appendix 19). The plan was to create working subgroups and, whilst exploring our technical training requirements, begin to plot sections of the OLR targeted at specific health professions based on the results of Phase 1 of this study. A summary of the meeting is shown in table 12.1-1.

Table 12.1-1 Main discussion points in planning meeting SLPN 12.03.2015

<p>Review of purpose</p> <ul style="list-style-type: none"> • Educational needs as identified in Phase 1 re-presented to SLPN. • Findings of reconnaissance stage (e.g. firewalls/web-building tools). • Initial process of working agreed. • Acknowledged OLR as opportunity for wider sharing of knowledge among LS rather than in cliques. • Need for repository of teaching materials agreed. <p>Ideas on layout</p> <ul style="list-style-type: none"> • Encouragement to start looking at ‘educational’ websites and OLR for layout ideas. • Example of an educationally-layered website layout described e.g. easy to advanced/expert. • Contrasted options of presenting the educational needs common to all HCP in multi-disciplinary pages or to present them by profession, tailoring the language to each particular profession. • Potential alternative to old SLPN website template shown on WordPress; group agreed to start with that. • I suggested tools to consider (feeds, blogs, Twitter). <p>Research process</p> <ul style="list-style-type: none"> • Recruitment to subgroups, only one person self-selecting, the rest asked to be put in a subgroup. • All keen to put it out to non-attenders so they have equal opportunity to participate, acknowledging this would delay starting work. • I suggested subgroup members keep a log/reflection of why decisions taken. • I explained that the exact time commitment was unknown as it would depend on their evolving plans and interest but gave an indication. • I offered subgroups an initial exploratory technical training session but encouraged them to start collecting ideas and materials until then.
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12.1.3 Actions taken in OLR development

The practical actions undertaken during this first three-month cycle (March - June 2013) were to create the subgroups that would work on different sections of the OLR and establish ways of working; based as much as possible on existing resources.

The reconnaissance activities established that in order to enable maximal access to the OLR within the NHS we would have to consider the software and server

used. My final rounds of testing with SLPN members during March 2013 established that we could use free software such as the blog-based WordPress or Weebly, but we would have to change the domain name of the OLR so that it would not be blocked by NHS internet servers as a social media platform. This was important, since at the time of this AR cycle, despite enthusiastic claims as to the benefits of social media to HCPs and patients, access for most NHS staff in Scotland whilst at work was restricted (Cleary, Ferguson, Jackson et al 2013; Health Improvement Scotland 2013, p13). Securing an independent domain name incurred a small cost (£2.99 +VAT per year). Fortunately, a short time into the study, the SLPN received a small bequest for use as an operational fund.

During the fortnight following SLPN1, more members consented to participate within subgroups; almost all expressed a preference for allocation to a subgroup. An exception was P8, who had expressed at SLPN1 that she wanted to be in the community/district nurse (DN) subgroup and invite the rest of her team (P11, P13, P14) to make up a subgroup of four. I noted in the field note immediately after SLPN1 that her colleagues might feel coerced. Further that I was concerned about group-think, that is, a subgroup made up of an existing team, working in the same setting, might produce a narrow perspective on that part of the OLR (Field note 25.03.2013). However, I reflected that the educational needs to be addressed from Phase 1 came from community nurses all over Scotland, so I had no rational, empirical reason to think that learning content produced would be any different from a more geographically disparate subgroup (RD 28.03.13). Shortly afterwards a fifth person (P9) asked to be in the DN subgroup; reassuringly their work setting was very different, and they were geographically remote from the other members.

A month after SLPN1, we had three subgroups. Each comprised 4 to 5 LS nurses/physiotherapists in addition to myself. One group would work on creating OLR pages for General Practitioners (GP subgroup), one for community nurses (DN subgroup) and one for LS peers (LS subgroup). No-one had volunteered for the Physiotherapist or Podiatrist pages so these were postponed for future consideration; re-emerging in Cycle 4 (section 12.4.4.3). Each subgroup had members from at least two health board areas.

Besides myself, each subgroups consisted of:

- DN subgroup - 5 nurses (P8, 11, 13, 14 from one team and P9 different health board)
- GP subgroup - 3 physiotherapists (P3, 12, 15 from one health board) and 1 nurse (P5, different health board)
- LS subgroup - 2 nurses (P1, P10) and 2 physiotherapists (P6, P20), none from same health board.

Different ways of working were established in each subgroup over the following months to June. The activities undertaken were as follows:

The DN subgroup allocated a subgroup leader (P11) and arranged for the four local nurses to meet weekly throughout May with e-mail contact to the remote member and myself. I was invited to face-to-face meetings on an as-needed basis, mostly for guidance and technical support. The inclusivity of the remote member (P9) proved difficult to maintain for both sides resulting in P9 having a role that was mostly reviewing content rather than co-constructing (RD 30.04.2013 and later interviews). The DN subgroup focussed on OLR content preparation. They divided the work between them and worked independently, off-line. They did not work online until I had given them some face-to-face technical training in a subgroup meeting at the end of May (Subgroup meeting field note 29.05.2013). During this meeting the subgroup members said they wanted to create some film clips to support skills training e.g. bandaging. We agreed to explore how this might be possible within existing resources e.g. by collaboration with the university in production of shared resources. By the end of this first cycle the DN subgroup had created a DN landing page and set up some sub-pages ready for their prepared content.

The GP subgroup had no nominated leader, but one physiotherapist and the nurse took on coordinating roles and met with me face-to-face to talk through their vision and plans, and have some technical training (09.05.2013). We created a site map for their section of the OLR, to achieve convergence of expectations (Appendix 21). Within a week of this meeting, both participants had attempted to

work with the online template. The remaining two subgroup members had contributed ideas but did not work online. By the SLPN2 meeting, there was a GP landing page and at least one subpage in development.

The LS subgroup was the most geographically dispersed. Discussions had started as early as mid-April within this subgroup as to whether the LS' resources should be with the remainder of the OLR on the WordPress template or alternatively link from it to a password-secured community within the NES website, Knowledge Network (KN) (RD 15.04.2013). The LS subgroup explored the tools and functions possible within KN for relevance to the functions they perceived it would need to perform for their peers. The eventual decision to locate the LS section of the OLR within KN was based on these investigations, along with my investigations regarding security of content. I noted in the RD (18.04.2013) that it would be interesting to see whether the structure and claimed technical support of KN would be an advantage to this subgroup compared to the others, or whether there would be advantages for the others in being independent of such structures. This is re-visited in later interviews. Numerous e-mails passed within the LS subgroup but, by the end of Cycle 1, they had not succeeded in meeting or registering as a community with KN.

My additional activities during this period included reaching agreement with the group on a temporary domain name. The plan was that when the OLR was ready for launch the domain name for the old SLPN website (www.lymphoedema-scotland.org) would be transferred over. The domain name of www.lymph-scotland.org.uk was purchased. In addition, using online community software (creatly.com) I taught myself how to create site maps in the form of flowcharts in anticipation of these being useful to the subgroups (RD 18.04.2013). Then, drawing on two main personal sources of expertise I set up a template for the OLR using WordPress.co.uk on a private server. Informal discussions with the IT support staff of my workplace and people in my social sphere who had built their own websites for small businesses, were useful, therein keeping to the 'existing resources' precept of the study. The placement of the OLR on a private server was an additional security measure which would satisfy the firewalls of the NHS systems. On this template I then created an example homepage for the OLR for demonstration at the next SLPN meeting (SLPN2).

At the start of SLPN2 and each subsequent meeting, each subgroup summarised their activities over the cycle period and asked for the views of the wider SLPN group. Following this, I would summarise my interpretation of the data and we would discuss some aspects in greater detail, as a collaborative evaluation of that AR cycle.

An inner cycle of work (McNiff 2013a) which occurred within Cycle 1 was the co-development of data sheets for the subgroups to feed back to the main SLPN group. Based on audit documentation, a draft Subgroup Feedback Sheet was circulated among subgroup members. After two rounds of feedback and adaptation, a much simpler form was devised and accepted for use (Appendix 15).

On a more theoretical basis my reading regarding the development of resources for HCPs was informing discussions within the subgroups, in particular, how content could be presented.

12.1.4 Data collection, analysis and evaluation of action

The dataset for this cycle included the transcripts and field notes for SLPN1 and SLPN2, subgroup feedback sheets, e-mail communications within subgroups and the wider SLPN, field notes from subgroup meetings and the RD. In terms of group evaluation of the action taken in this cycle, the primary data item was the transcript of SLPN2 since this recorded the group reviewing Cycle 1. The remaining data items provided supplementary information, at times capturing the decision-making processes and ways of working.

The dataset for Cycle 1 was subjected to framework analysis (Ritchie and Lewis 2003) using the categories of a Logic Model - Purpose, Context, Inputs, Activities, Outputs, and Impact (Kellogg Foundation 2004), (see 12.4.5.1). The analysis was done under academic supervision and fed back to SLPN members for discussion.

Each data item was analysed separately so that different data types were not mixed. Data were categorised and then coded in sub-categories e.g. Purpose is shown below (Table 12.1-2).

Table 12.1-2 Sub-categories of Purpose in framework analysis

Sub-category code	Description
1.1	meeting lymphoedema specialists' need
1.2	meeting the generalists' need
1.3	raising awareness
1.4	to inform other contemporary projects
1.5	a research purpose
1.6	other - not yet coded

The sub-categories for Purpose emerged from the group discussions with SLPN members, particularly in the transition between Phase 1 and 2 of this study; in contrast, the sub-categories for Input were terms commonly found in project management or quality improvement literature i.e. time, funding (budget), skill and knowledge, willingness (e.g. www.qihub.scot.nhs.uk/knowledge-centre/quality-improvement-topics/project-management.aspx). That is, a practical approach was taken to naming the subcategories on the basis that, through a process of category collapse and expansion, they would be validated, or not, by emerging data. For example, I had anticipated subcategories of Context to include 'healthcare changes within Scotland' and 'healthcare changes beyond Scotland', but there was so little data mapped to this, that Context became a sub-category of Purpose. On the other hand, the addition of an 'other' code prevented data being forced into existing subcategories.

Since the main research question for Cycle 1 was the nature of existing resources and how they might be used, the framework categories of primary interest were Input and Activity. The data in these categories were therefore analysed first from the transcript of SLPN2 (SLPN meeting 25.06.2013) and then the broader data items were analysed for confirming and disconfirming data and new factors.

Sub-categories of Input were anticipated to be ‘time’, the ‘skills and knowledge’ and the ‘willingness’ of people within and around the SLPN to participate or help, and ‘funding’; with a sub-category of ‘others’ for emergent factors. One such emergent category of resources was the material teaching resources (e.g. photographs and presentations) which I had anticipated being associated with ‘skills and knowledge’ but had more association in the data with ‘willingness’.

12.1.4.1 Time

Apart from my time as researcher, no additional time had been given to SLPN members to create the OLR, therefore of interest was if and how the resource of time might be reallocated or renegotiated in practice. In the data, time was spoken about in different ways:

- time as a resource to be managed
- lack of time as a barrier to ways of working
- time as a concept that was dependent on skills and knowledge.

An example of time being a manageable resource was described in SLPN2. Discussing the co-development of standardised teaching materials, one participant suggested using the normal Continuous Professional Development (CPD) time of the SLPN meetings to work on creating the OLR (P8/ SLPN2/319/25.06.2013); and the DN subgroup reallocated time from weekly service development time. However, some participants reported that the OLR activities were taking longer than anticipated.

... it's quite time consuming an hour and half goes and you haven't done anything ... we're hoping that soon we'll get quicker [but] I think it is going to take an awful lot of time.

P8/SLPN2/670/25.06.2013¹

There was, therefore, an assumption of an ability to learn and improve skill levels and with it lessen the time demand.

¹Utterances are labelled: participant code/meeting/line number/date. Underlining represents key phrases coded.

You know time is of essence and it will take me longer to do it initially but I'm sure once I know how to do it I'll be better...

P5/SLPN2/483/25.06.2013

The learning approach of these core members seemed predominantly to be learning-by-doing (Dewey 1963).

We won't know how much help we'll need until we actually try.

P6/SLPN2/439/25.06.2013

However during our evaluation of AR Cycle 1 (SLPN2), I expressed my view that it appeared some people had different learning preferences, and therefore the time required and activity undertaken within that time may differ. If so, this was something which would affect the model of OLR development which could be explored when more data were available.

... some people will be happy to just play and explore it [the online template] and other people will want showing a few times quite possibly.

R/SLPN2/652/25.06.2013

Despite the LS subgroup members being the most geographically dispersed, they felt strongly that they would work better by meeting face-to-face (LS Subgroup Feedback report 25.06.2013). Time then became a barrier, because to meet they would need to allocate a whole day out of their busy clinical diaries. This subgroup's e-mails showed multiple attempts to fix dates, without success. This chosen way of working meant that progress was slow. This was reported back to the main group at SLPN2.

...our progress hasn't been that great. ...Either diaries were busy or people were on holiday ...[but it] should be really helpful for us to be face-to-face.

P1/SLPN2/387/25.06.2013

In addition, they found that the instructions to set up a community area on the KN were not as straightforward as they had hoped and therefore not found sufficient

time during work hours to complete this; showing a link between time and skill/knowledge level. However their report shows a willingness to take the issue home and try again in their personal time.

*...to try and set up a community on the Knowledge Network ...
Difficulty following example community through, due to time
 restraints at work and no facility to print off toolbox. ...[but] then... [I
 was] not able to login for some reason at home.*

LS Subgroup Feedback 25.06.2013

The need to meet face-to-face was not challenged in the SLPN evaluation at SLPN2. I reflected in the field note written immediately afterwards that in a future cycle we may need to explore the need to meet face-to-face, and whether this preference would change over the course of the study and if so, what reasons might be given.

12.1.4.2 Skills and Knowledge

During Cycle 1, skills and knowledge were resources we shared internally and sought externally. External sources resources accessed by subgroups included the KN, informal IT support, online information regarding free software and educational websites, professional bodies, CoPs of other specialities, commercial suppliers, and peers from other similar professions, and an experienced project manager (P4). The latter was a guest of the SLPN during this period working on a different project but at the start of Cycle 1 had offered help

My input would be more around giving examples of audit sheets or case study sheets that you could maybe adapt.

P4/SLPN1/186/12.03.2013

Internally, a lack of knowledge or experience specifically related to OLR development, aside from my own limited experience, had been acknowledged by those present at SLPN1 at the start of Cycle 1 (12.03.2013). This was confirmed verbally throughout the cycle except for one participant (P20) who had previously used a website template. This participant was in the LS subgroup which had yet to

access the KN template therefore how relevant her experiences would be was unknown. I revisited her experience in Cycle 4.

I set up a draft OLR for participants to see an example of what it might look like and made an example site map. Nevertheless, this was not without quandary. On the one hand, this was making good use of the existing resources of the group (reflecting my role as participant), but on the other hand I was worried that it would seem directive and not encourage the participants to explore their own ideas thereby creating greater ownership and sustainability of the end product (reflecting my role as researcher). I noted in a memo-to-self during initial analysis of the SLPN2 transcript, that the researcher role may be something that merited future discussion in order to explore the perspective of participants.

It was anticipated that subgroup members would also use each other as resource, in terms of seeking feedback. On hearing the LS subgroup describe its plans for the OLR pages, other SLPN members confirmed the perceived value.

P8: I think it looks a good concept especially the research part to try to keep up to date

P3: ...or if people have been to conferences

P1: yes just to share learning

SLPN2/399/25.06.2013

Similarly, when the DN subgroup fed back to the main group, other SLPN members affirmed the value of their plans.

P1: I think the videos are a good idea

P5: Because you spend a lot of time ... with the district nurse of that practice ...and that can lead to another few practices being involved, but then that's just for that patient and that community. ...[the video] ...will reinforce what you're doing with them face-to-face,

SLPN2/688/25.06.2013

This affirmation is similar to what Holton (2001) described as 'caring talk' and is foundational in building the infrastructure necessary for online collaboration. Group affirmation at this early stage of development was likely to be important

socially and psychologically, to build confidence and a shared understanding of what was to be built. This could be explored in later interviews with participants. However, being aware that the AR approach would rely on an iterative dialectical style in which we should challenge each other's thinking, I asked the group if giving and receiving critical feedback was going to be difficult. The following extract of the transcript shows the participants taking ownership of the OLR development and negotiating how criticism would be given and received. In doing so, they link the discursive group process with their likely satisfaction with the end product.

R: [When] people have invested more work in each of these pages do you think as a big group that it's going to be hard to criticise it? ...

P8: We should all feel free for comment, I'd be quite happy for someone to comment on

P3: hmm yes

P6: I think so long as its constructive criticism, because I think we've all worked with each other for long enough I think that we should be able to, otherwise it's not ever going to feel as though it's a satisfactory end is it? And there is always going to be different ways to put things but I think we've all worked on enough documents. So hopefully as long as it's done tactfully then we'll be quite happy for that.

P1: yes

P6: ...and as xxx[P3] was saying, sometimes you want to put something there, you know it's not quite right, but it's the best you can do at the time, whereas somebody else might look at it and say well if you just change that round... because I think sometimes you just get stuck....otherwise you would never put anything up in case somebody commented on it. So I think we're all going to be quite comfortable to comment. It makes it easier actually to put something up.

SLPN2/743/25.06.2013

Analysis of the transcript exposed two of my assumptions, as researcher, related to sustainability of the OLR. First, that the group would be willing to accept constructive criticism from each other and from end-users. Second, that there was

a willingness to sustain the OLR in the long-term. This was noted as a possible influence on the participants.

R: [When we've] reached the end of the time frame for my research project you've got your way of working, so the project can carry on ... because ... this is an ongoing thing isn't it, ...knowledge is developing the whole time.

R/SLPN2/608/25.06.2013

The timing and wider relevance of the OLR to SLPN members was highlighted by the guest member (P4) who linked the concurrent national development of electronic GP referral forms to Phase 2 (Minutes SLPN2, 25.06.2013). I also linked the work to other contemporary projects e.g. care pathways (Scottish Government 2013a). In doing so, both P4 and I were contextualising the study.

P4: It's good that the GP referral connection can be on there [the OLR], as well as through their normal GP systems, just to raise awareness really

R: ...all of you ...in various ways have been working on pathways and things with SMASAC ...obviously it makes sense for it all [OLR] to reflect ...if not directly link in to, whatever documents are produced. And if there was such a thing as a national referral form or a national minimal dataset then obviously that could be....

SLPN2/539/25.06.2013

There were times when participants drew on me as a teacher for pedagogical theory assumed from my higher education role. For example in a meeting with the DN subgroup we discussed contemporary learning theory regarding making OLRs as interactive as possible whilst we weighed this against current participant skill levels and their perception of the need for someone to monitor the OLR regularly if it was interactive (RD 29.05.2013).

We discussed whether they wanted the interactive blog element to be visible on each page or only on the main page...how education theory would generally support a more interactive approach than a

transmission one...They agreed that they ...would decide later when they had more skills and knowledge to make an informed judgement.

RD 29.05.2013

As a researcher I encouraged all three subgroups to consider the findings of Phase 1 of this study when they were planning content. For example, I e-mailed the DN subgroup a chart reminding them of the needs identified by the DNs, and of the LS' perception of DN need (Table 12.1-3). Each of these I had divided into information need, educational need and mixture of both. This was an approach we had discussed briefly in the planning and reconnaissance period and which had informed my literature searching in the domain of information seeking e.g. Case 2012, (see also 13.3.4.2).

I wondered if the attached would be useful to you in your considerations about what you want the content, look and layout of the DN webpages to be. I have divided this chart roughly into things that I thought were just information, things that were 'a bit of info and a bit education' and things that are actual education because I thought it might affect how the need is addressed.

R/e-mail to DN subgroup/18.04.2013

Table 12.1-3 DN education needs from Phase 1.

Type of Practitioner	Source of Evidence	Information Need	Information and Education Need	Education Need
District / Community nurse	Survey (Qs 6, 11) self-identified need	Awareness of current management. Preventing cellulitis/emollient use	Assessment/differential diagnosis of chronic oedema/lymphoedema. Wound care with lymphoedema.	Management of oedema in advanced disease
	Specialists' survey (Q21) additional perceived needs		Applying supportive bandage for oedema in advanced disease	

At times subgroup members appeared to have difficulty reconciling their opinion (as LS) of what a GP/DN needed on the OLR, and the GP/DN self-identified educational needs from Phase 1. Participant P5 of the GP subgroup described a moment in a subgroup meeting (10.05.2015) when they realised that regardless of the LS' opinions of GP need, the GPs had primarily identified an educational need in identifying and diagnosing lymphoedema. Looking then to the Phase 1 results the subgroup planned the layout around the five main topics identified by the GPs but used these to design incidental learning on the subjects the LS identified as need.

...we thought 'right this is what we want all GPs to know' but then we had to... step back and get them to think 'well is it lymphoedema' and maybe do all the checks that you would normally do before you send, [the patient] in to the service.... So we got ... five main topics on the front page...

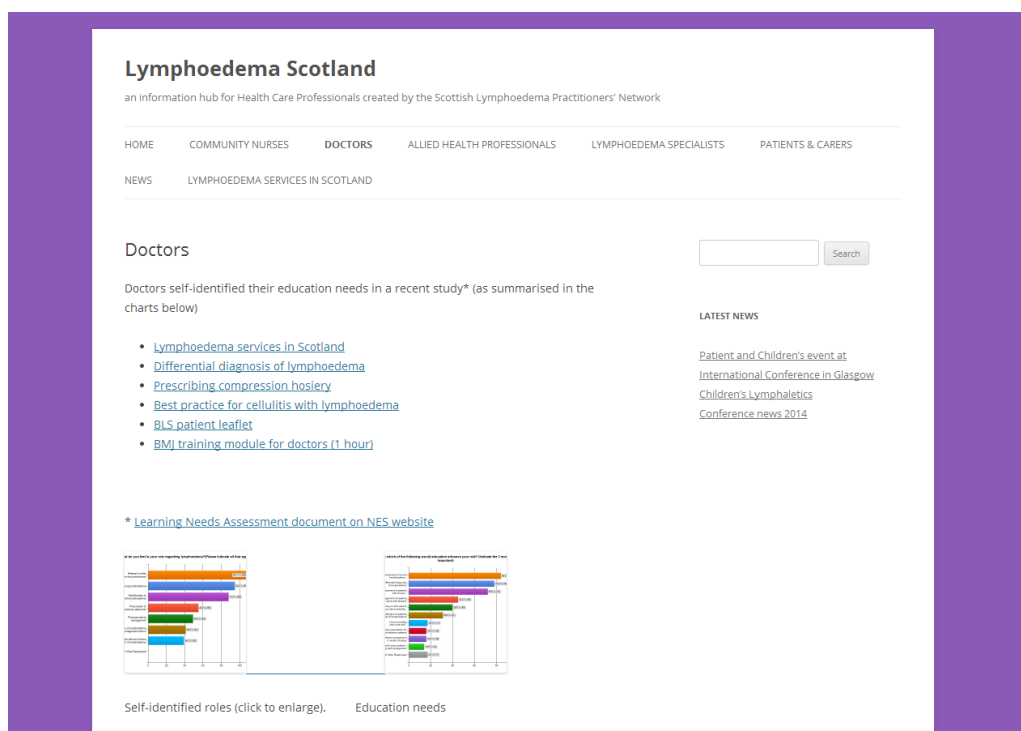
P5/SLPN2/468/25.06.2013

Nevertheless, an additional topic was added, based on their collective experiences. This arose from a problem they faced regularly in clinic which was the prescription of inappropriate compression garments by GPs.

When I had a talk with xxx [P12] and xxx [P15]... the only other topic on that list for GPs they had was garments...they have...difficulties with GPs not understanding about garments and what they can get and how the process is, so they thought it might be useful to have another one [main topic] about that...

P3/SPLN2/553/25.06.2013

The layout of the GP home page ultimately reflected this strong alignment with Phase 1 findings (Figure 13.1-1).

Figure 12.1-1 Screenshot of GP home page on OLR

In this first cycle, however, the DN subgroup appeared to draw on their experiences in teaching DNs, with no explicit reference to Phase 1 findings. At SLPN2 participant P8 described to the wider membership their first two subgroup meetings and the resources, skills and knowledge they drew upon.

..the first meeting was brainstorming ideas about what we want on the website... what we think district nurses would look for ... We also spoke about videos, and the cost ... We then searched the web ...but there was nothing suitable, we then approached xxx [the researcher] about how we could go about doing that...

P8/SLPN2/619/25.06.2013

12.1.4.3 Funding

In the quotation above P8 brings in another resource implication, funding. When the DN subgroup asked me about producing a video I was able to explore opportunities for us to collaborate with the university. Since the University also needed video teaching resources (of nurses demonstrating bandaging skills), we were able to negotiate with managers that the subgroup members would give a morning of their time for filming while the university provided the filming

facilities and expertise. We therefore felt happy that the videos produced were within the asset-based spirit of the study. The time given to film the demonstrations could save several hours of live demonstration (bandage training) over the forthcoming year or two. In addition, the resource would be accessible, as needed, by nurses in the community, rather than them having to wait until the next available training session.

The only specific funding identified therefore was the small amount for a domain name (£2.99 +VAT per year).

12.1.4.4 Willingness

Notwithstanding the permissions required by managers for participants to be involved in this study by reallocating some of their teaching and CPD time, and permission to use their work-based computers, the study relied on the voluntary participation of both SLPN members and OLR end-users. Willingness was therefore a subcategory of Input in the data analysis but was more often captured in Activity. Willingness was evident in both actions and dialogue. The aim in Cycle 1 was to see whether or not there was empirical evidence of willingness, rather than to explain the cause or motivation. Willingness to undertake actions was relatively simple to record and discuss. Participants taking time to experiment with how the OLR templates worked, and making effort to search for other resources, were actions which demonstrated a willingness to participate beyond statutory meetings. Further, P3 of the GP subgroup described her feelings as she pushed the boundaries of her skills and knowledge. In this utterance there is a willingness to expose vulnerability in the learning process.

I think it's a bit daunting initially to actually put something on a website and you think 'oh are other people going to look at it' and not knowing how things work but it's kind of... I've just been trying to put things on irrespectively of how I felt about it. ... at least it's something on and then hopefully I'll get more confident and from there on better things will kind of come from it.

P3/SLPN2/487/25.06.2013

The production of artefacts such as a design workbook also demonstrated willingness to fully participate, e.g. P1 of the LS subgroup had produced a source book.

I just put down some kind of stickers for myself of just what all us were saying was needed. ...I had ideas about how we could, like wound care was down and I thought links to... tissue viability have got a forum ... or ... there's the leg ulcer forum ... if they've got ...a website we could link into for advice..

P1/SLPN2/306/25.06.2013

Interpreting willingness from dialogue was more complex. It required consideration of the gap between stated intention and action. For example the multiple e-mails between the LS subgroup to arrange a meeting implied great willingness but it would be difficult to establish actual willingness to meet without further examination of the barriers to meeting, in this case geography, time (busy clinics), preference to meet face-to-face and, potentially, time before they considered working virtually. I suggested that a partial virtual meeting may be necessary (LS subgroup e-mail 19.05.2013) but this did not occur until Cycle 2. This prompted the question of whether or not ways of working would change, which was subsequently explored.

12.1.4.5 **Other: sharing teaching resources**

A factor that became associated with willingness in Cycle1, and which recurred in subsequent cycles, was the matter of sharing teaching resources. In Phase 1, LS had identified that a pool of teaching materials would be useful. The LS subgroup was setting up its section of the OLR in KN so that it would be a password protected area for the group to share problems and resources. However, even at this first evaluation there were indicators in the data that sharing some resources could be problematic.

In the following extract the suggestion of co-produced standardised teaching materials was initially viewed positively, with people agreeing time for development and suggesting sourcing materials from the group's professional body (British Lymphology Society, BLS). However a barrier emerged regarding the

potential over-use of patient photographs, which led to a long discussion on permission levels.

P1: You know it would be good to have something that was kind of standardised. So if we had some photo slides and case studies, suggested reading that we could all use for teaching...

P8: Is that something that we could work on as a group maybe in the afternoons of the meetings?

R and others: yes

P1: to produce some stuff ... that we could then put it [learning content] on [the OLR]. ...and we would know that we were all doing a kind of similar

P8: [nods in agreement]

P16: Do BLS still have their education stuff?

P8: the only problem with that ...is that if you put some photographs in for us all to select you might find that the same photographs may be being used every talk, ... there'd be no variety.

R: yes [hesitant] is that a bad thing you think?

P3: It would be a different audience

[Lots of people speak across each other]

P8: we'd have to think of the location

P4: Quite a lot of photographs you see are just covering the face, just an arm or a leg; you wouldn't be able to identify...

P8: There's not many of facial swelling, I do have a good one but that's my...fear, that it's not fair to set it about the country... my patient signed [consent] for xxx [health board], we would have to look into whether we were able to give it to another health board...

SLPN2/313/25.06.2013

I reflected later that addressing the legal issue of the use of photographs may not have addressed participant P8's anxiety regarding excessive use of certain photographs; we would see over the subsequent cycles if this was an issue that was overcome (RD 28.06.2013).

12.1.4.6 Other categories of the framework

In relation to the other categories of the framework, there were relatively little data specifically on Purpose and Context, aside from the concurrent projects mentioned by myself and P4, which may be because context could be taken as a 'given' in this pre-existing network of professionals. Output and Impact were discussed in terms of the value of the OLR to their own practice, and to the end-users (GPs and nurses), but not specifically in terms of the impact on patients.

12.1.4.7 Summary of evaluation of Cycle 1

Peoples' skills and knowledge of OLR development, time and funding were shown in the data to be sparse resources, with only one participant having used an online web/blog -build template previously. As researcher I brought in empirical evidence of need (from Phase 1), some experience of learning theory and OLR building, plus a suggested process and the time to conduct reconnaissance and coordinate the setting up of the project. While the progress of the OLR development through a first cycle was indicative of a willingness of SLPN members to participate at various levels, early indications were that there were some issues which might test that willingness, such as the sharing of teaching resources. Further, that however willing the participants, there were barriers such as time which might not be overcome without a change to their anticipated way of working.

12.1.5 Specifying the learning: discussion of Cycle 1.

This relatively short cycle of 3 months was aimed at checking the findings and assumptions made during the reconnaissance period between Phase 1 and 2, and setting up an initial way of working that would stimulate a collaborative AR approach to the OLR development.

12.1.5.1 Assumptions tested in action

The confirmation of some assumptions was made by actions in practice. That is, the tacit support of line managers, suitable access to computers and software (notwithstanding some local negotiations required to overcome variations in

restrictive firewalls), and informal support of IT-proficient colleagues and friends, were factors which, whilst agreed in principle beforehand, could only be tested in practice. Similarly, although an initial way of working could be agreed at outset, how workable it would be to all who wished to participate, and the willingness of individuals to engage, was unknown.

12.1.5.2 **Willingness: evoking motivation theories**

Throughout Cycle 1, as I negotiated the dual role of participant and researcher (Trondsen and Sandaunet 2009), I was pleased with the apparent level of willingness of core members to engage, to recruit members who were not at the initial meeting to subgroups, and to look for further resources (Field note 25.06.2013). The use of the term Willingness had initially arisen in my reflections; subsequently it had been a conscious decision as a term for data analysis in Cycle 1 rather than the term motivation. The following were used as working definitions:

Willingness: the quality or state of being prepared to do something.

Synonym: readiness.

Motivation: a reason or reasons for acting or behaving in a particular way

(Oxford Dictionaries, 2014).

The decision to use the term ‘willingness’ was based on the research question for Cycle 1 which asked *what* the resources were, not *why*. Having established in Cycle 1 that there *was* willingness and that there seemed to be different levels of willingness, then a consideration of motivation in future cycles seemed justified.

In this regard a number of theories might be considered over the next cycles. Taking one perspective, in relation to the expressed benefits to be gained from the OLR, one might consider for example Expectancy Value Theory (Atkinson 1966), or the related Theory of Reasoned Action (TRA) (Ajzen and Fishbein 1980) and Theory of Interpersonal Behaviour (TIB) (Triandis 1977). Taking a second perspective, focusing on the participants’ learning (e.g. P3 and P5) and the expected benefit to their ability to support other HCPs (e.g. P8), one might consider Bandura’s self-efficacy theory (1977). A third perspective might focus on

the type or quality of the motivation, that is, whether it is intrinsic or extrinsic and what factors might affect this. For example when P4 and I contextualised the study in terms of relevance to concurrent projects, we reflected, we were aware of trying to motivate our peers by increasing the salience of their efforts to broader organisational activities. Aligning organisational goals with personal goals evokes Deci and Ryan's (1985, 1987, 2000) Self-Determination Theory (SDT). In this, some people may be extrinsically-motivated by identification with organisational goals, whilst others go further and align organisational goals with their own so much as to integrate them. Ryan and Deci (2000) argued that such integrated goals produced a motivation which was very similar to autonomous motivation and therefore most likely to create sustained effort. Similarly, the expressions of a desire to learn and to improve practice (P3, P5, P8 and others) may be indicative of intrinsic motivations, but whether these are sustained, and in what way they affect the process of OLR development would need further data to substantiate. Motivation can be studied by observation of behaviour, analysis of outcomes and/or self-report, such as with interviews (Schunk and Zimmermann 2008). Ethical approval had already been gained for participant interviews, giving the possibility for exploring motivation with individuals later in the study.

12.1.5.3 Clinicians as teachers

In designing the content of its OLR pages, the GP subgroup made explicit reference to the findings of Phase 1, in contrast to the DN subgroup. There is, however, no evidence that the DN subgroup did *not* take those findings into account, only that it was not overt within the Cycle 1 dataset. As DN subgroup members worked together on a daily basis, ongoing conversations were not captured as data. An alternative explanation was that this team had been regularly running training sessions for community nurses for years, therefore may have felt they had a good idea of DN educational needs. The validity of this argument would be tested when the DN pages of the OLR went out for end-user testing. Such testing may not identify omissions though, since the end-user may be blind to what they don't know. In practical terms, a LS is not going to know all the latest peripheral information and contextual influences on the community nurse, any more than the community nurse can be aware of deficits in their knowledge of lymphoedema management. The combination of both sets of information, DN self-identified needs and LS perceptions of DN needs, produced

during Phase 1, is a means of overcoming the blind spot as referred to in the Johari window (Luft 1970) and is an advantage of the research approach taken.

12.1.5.4 A reflection on group norms prompts consideration of group characteristics and label

Sustainability of the OLR was an issue raised in the meetings. Sustainable and ongoing change is an issue of importance in AR (Reason and Bradbury 2008). Sustainability is more than the practical resources to sustain the practical changes (Hynes 2013); it is an aim to create third-order change (Coghlan and Rashford 2006). That is, change that creates an environment where fundamental assumptions and attitudes about everyday practice are questioned. My decision to use AR assumed that we could mutually critique our work in developing the OLR. On noting a lack of critique during Cycle 1, I reflected on the working norm of the group. My impression of a non-confrontational norm was confirmed by another member (P6), who agreed that the group was not openly confrontational or challenging, any opposition was likely to be expressed in quiet non-participation.

The group is a practitioners' network by name, having originally been set up as a special interest group for peer support of the first few LS in Scotland (SLPN Constitution 2003). There are no definitive descriptions of a practitioners' network, therefore I refer to the purposes within the constitution of the SLPN at the time of Cycle 1 (Figure 13.1-2).

Figure 12.1-2 Purposes from SLPN Constitution (2003)

To review, share and develop best practice
To develop and support the implementation of best practice in lymphoedema management within the remit of NHS Scotland
To identify lymphoedema practitioners who provide a service to NHS patients in Scotland
To provide peer support
To provide an advisory service to other professional groups
To take an active role in education
To increase awareness of lymphoedema
To participate in research projects
To liaise and maintain links with relevant organisations

Two concepts similar to a practitioner network are professional networks and CoP.

Professional networks, of sorts, have existed for centuries, from traditional organisations for tradesmen, to professional networks forged through college alumni. In contemporary usage, the term is more likely to be associated with global digital networking, e.g. LinkedIn, or entrepreneurship and leadership (Ibara and Hunter 2007). A recent study involving lawyers in North America, concluded that the central focus of contemporary professional networking has become self-interest rather than building social capital (mutual support and collaborative initiatives) (Casciaro, Gino, and Kouchaki 2014). This view may only be representative of a Western culture but was noted.

Most health professions and specialities within them, have professional bodies which hold regular conferences, such as the Chartered Society of Physiotherapy (CSP), Royal College of Nurses (RCN), and British Lymphology Society (BLS). Many have virtual communities in online forums (e.g. iCSP, a physiotherapy online forum) or hold regional meetings (BLS) with educational aims. Networking for professional development is recognised as one of the main reasons for attending the conferences of professional bodies, although there seems little discussion of the learning theories involved.

In contrast, the concept of Communities of Practice (CoP) emerged from a thesis describing a learning theory, Situated Learning (Lave and Wenger 1991). Popular in education, health and organisational development literature (particularly in organisational learning and knowledge management), CoPs are recognised as a mechanism through which knowledge is created, held and shared (Brown and Duguid 1991; Lave and Wenger 1991). Lave and Wenger (1991) described the concept of Legitimate Peripheral Participation, learning from observation and involvement in the practice and associated informal social interaction, rather than formal transmitted teachings. They studied apprentices and stressed the identity-forming and continuous nature of situated learning, which was in stark contrast to the dominant individualistic cognitivist models of the time. Situated Learning theory focussed on the tacit, relational knowledge of the workplace. The learner is motivated by learning to conduct tasks within a particular context and identity. By dealing with conflict and change within a community there is legitimisation of practice. There is socialisation akin to other educational theories but the legitimisation process can allow for variations and evolution rather than straightforward reproduction of practice.

...individual learning should be thought of as emergent, involving opportunities to participate in the practices of the community as well as the development of an identity which provides a sense of belonging and commitment.

Handley et al, 2006 (p642)

Studying Situated Learning therefore requires consideration of the context of the learning, that is, the identities and community in which the practice occurs.

In the same period, the work of Brown and Duguid (1991) focused on practice in organisations; in particular, when informal groups formed to improvise solutions to novel workplace problems. They emphasised that the way people conducted their work and the lines of communication in real life were not as described in formal procedure documents or designated hierarchies. The authors argued that a more accurate understanding of work (or practice) may be gained from narratives, and that organisations could benefit from recognising shop-floor innovation. Differences to Lave and Wenger (1991) include a more egalitarian structure, rather than masters-and-apprentices, with little reference to legitimate

peripheral participation. In addition, there is greater consideration of the relationship of the CoP with the context and organisation. Conflict is implied as being with the organisation rather than within the CoP, therefore possibly losing the opportunity for learning from the legitimisation process described by Lave and Wenger (1991).

Neither of the above bodies of work explicitly defined a CoP. One further significant perspective on CoPs was that of Wenger's (1998) work on learning, meaning and identity. Here a CoP was defined as a group that bonds through mutual engagement on an appropriated enterprise and which creates a common repertoire (language and behaviour). Wenger (1998) noted that the members of a group may not call themselves a CoP but that indicators included:

- A sustained relationship - harmonious or conflictual
- Shared ways of doing things
- Ability to assess appropriateness of actions and products
- Rapid flow of information and innovation
- Knowing each other's skills and limitations
- Mutually defined identities
- Group jargon, shared jokes and lack of pre-amble
- A shared discourse reflecting a certain perspective on their world

The focus moved particularly to the formation of identity and the dynamic operations of the community, that is, the mutual creation of meaning, social identity and learning (by doing and by belonging). Power was not a central concern, but conflict remained part of the relational make-up (see first bullet-point above). Wenger (1998) described the CoP as a broad conceptual framework rather than a formal theory, while others described it as a universal social phenomenon (Cox 2005).

One of the main criticisms of all three theses has been the use of the word community, as it can give the impression of consensus, localised, homogenous, unpurposive, or static, yet a reading of any of the aforementioned works would

clarify that CoPs are likely to be the opposite. What remains clear is that the term, CoP, is ambiguous enough to be interpreted in different ways (Cox 2005).

Cox (2005) asserts that it is the ambiguity of the CoP concept that has led to its use in so many domains. Saint-Onge and Wallace (2003) developed three categories for CoPs (Informal, Supported or Structured), set against six characteristics (purpose, membership, sponsorship, mandate, evolution and main outcomes). Within this typology, at the start of this study SLPN would be described as Informal, in that its purpose was to support the members, it was self-forming, unsponsored, had a constitution defined by its members and development was organic rather than strategic. The main outcomes were individual capability development and codification of knowledge useful to members. However, as will be later described in Cycle 4, changes in response to questions raised in Cycle 3 meant that criteria-led membership of the SLPN was considered, and the OLR project moved the focus of outcomes towards building organisational knowledge and building capability relevant to achieving organisational goals. These represented a formalising of structure which would be characterised as a Supported CoP (Saint-Onge and Wallace 2003). The impact of this on ways of working and relationships within the group was as yet unknown.

In the descriptions of CoP by Lave and Wenger (1991), Brown and Duguid (1991) and Wenger (1998) there is commonality; meaning is locally and socially constructed, and identity is central to learning. In subsequent work, Wenger McDermott and Snyder (2002), whilst promoting CoP as adding value to organisations, acknowledged that CoPs were not a panacea; there was a downside, such as becoming static or too comfortable, thereby stifling progress, innovation or learning. Subsequent literature provided further critique. Cox (2005) argued that there were significant divergences within the conceptualisations of community, learning, power, change, formality and diversity within the three studies cited above. Some of the limitations were expanded in later critiques (Roberts 2006; Handley et al 2006). The negotiation of meaning, for example, will be affected by power, a factor mentioned but not addressed by Lave and Wenger (1991), so that for example, despite heterogeneous participation the negotiated meaning continues to reflect a dominant power (Roberts 2006).

Related to this is the concept of participation. In the original Lave and Wenger (1991) study of apprentices, participation was seen as a linear progression, linked to learning and socialisation, from the periphery to the core. The concept of doughnut-like rings of participation was later challenged by Lave (2004) asserting that the learning may not lead to being a core member. In some situations people choose to operate on the periphery of a CoP (Wenger 1998; Handley et al 2006). This may be because of their involvement with several CoPs and that this boundary work is a deliberate learning strategy for both the individual and the CoP (Wenger 1998). It may be because the individual feels a lack of identity with the CoP, so that maintaining a peripheral position reduces inner tensions between identities (Handley et al 2006). A key assumption in the CoP literature is that participation entails a sense of belonging and yet there may be people who participate in an activity without engaging in any deeper sense. Handley et al (2006) suggest a useful distinction between *practice*, as being the activity, and *participation* as being meaningful activity involving relationship and shared identity in the meaning-making. From a research method perspective this practical distinction is useful since the former can be observed while the latter requires further interaction with the individual participant, such as via interview.

Contemporary literature describes CoP as groups of similar professionals who may be working on similar but separate projects. Cox (2005) suggests that, for these, a more accurate term would be communities of practices. These may be more similar to professional networks. This further variation of CoP was considered as a description of SLPN; that is, whether they were a professional network, a CoP (and which type) or a community of practices or indeed none of these. A further complication was that the implication of Wenger's (1998) conceptual framework was that focussing the activities of SLPN members onto one particular enterprise, the co-production of an object (OLR), could increase the sense of identity and belonging and therefore the state of the group might change into a CoP from a looser connection.

The Wenger et al (2002) text marks a notable shift in the literature towards a commodification of CoP as a management tool, specifically, an organisational Knowledge Management (KM) tool. The emphasis is on the learning organisation rather than the individual, and on innovation and competitive edge rather than problem-solving in daily work. With organisations working across multiple borders,

geographical and professional, the descriptions of CoP become increasingly distributed and the concept of the Virtual Community of Practice (VCoP) appears in the literature (Dubé, Bourhis, Jacob 2006).

The addition of technology allows for greater geographical spread and more immediate communication but reduces (or loses) the face-to-face relationship which seemed core to the original conceptions of CoP. Whilst much of the literature on the nurturing or sustaining of CoP may also apply to their virtual equivalent, there is some debate that a distributed CoP can exist at all (Schwen and Hara 2003). The central role of technology, whether or not some face-to-face contact remains, changes the reality for the participants and may therefore change the characteristics originally described by Wenger et al (2002) and Saint-Onge and Wallace (2003). In a seminal study of VCoPs, Dubé et al (2006) synthesised the findings of an extensive literature review and qualitative study of 18 VCoPs within 14 organisations to develop a typology of VCoP within organisations. This significantly expanded and developed the characteristics suggested by Wenger et al (2002) of size, life span, geographic dispersion, boundary span, creation process, and degree of institutionalized formalism. Dubé et al suggested that their framework of 21 structuring characteristics could help identify the challenges, strategies and practices which are contingent on the different characteristics identified. One of the limitations of their work was that it only related to CoP within organisations. Acknowledging the increasing use of CoPs across organisational boundaries or groups devoid of organisational sponsorship at all, Hara, Shachaf and Stoerger (2009) developed a typology to include non-organisationally bound VCoPs. Their extension is useful for groups such as SLPN where members may have different concepts of their organisation; for some this is NHS Scotland as a whole, or their local health board or hospital, for others it may be the hospice from which they provide a service for NHS patients. In my case, my primary employing organisation was a university however the organisational aims I visualised addressing with the study were those of NHS Scotland.

Previous research has studied the outcomes of the creation of a new CoP, involving clinicians and academics, to create learning resources to influence health care practice (e.g. Tee and Böckle 2012). However, detailed study of the internal practices and how they might change within an existing community when

required to work more virtually, is lacking. Dubé et al (2006) described two opposing forces the evolving community might face. On the one hand, a resistance to change which may be from habit or discomfort with technology; on the other hand, the shared history can provide a relational familiarity which can ease the transition. The authors claim advantage to the experienced group in that there is existing shared purpose, established roles, defined norms and some legitimacy. However, I would contend that the change may challenge previously negotiated legitimacy, and the new way of working may challenge entrenched roles and norms. I propose that whether the pre-existence of the group added resistance or eased the transition as Dubé et al (*ibid*) suggest, would depend on their involvement in the decision to become more virtual. The AR process of cyclic negotiation had the potential to increase legitimacy of the change within the group and the sense of involvement in decisions.

12.1.5.5 **Sharing resources and getting started online – what are the barriers?**

At the end of Cycle 1 there were some data to suggest there may be a reluctance to share teaching resources or at least to share photographs. However this may have been an issue of clarifying permission status. If the former was the case then one of the core assumptions of the creation of a repository for the LS themselves may be challenged. In a conceptual thesis on antecedents of virtual team collaboration, Peters and Manz (2007) acknowledged that expertise, time and money constrained collaborative projects. However, they argued that cognisance of the nature of relationships, trust and a shared understanding were important. Our data implied that the core members of the SLPN knew each other well enough from previous projects to have what Peters and Manz called cognitive-based trust, or at least an organisation-based professional trust. Whether this would be sufficient for the sharing of resources, notwithstanding legal limitation, would be seen in later cycles.

Another issue that emerged in the first dataset was that the shared understanding of the task was not as clear as I had assumed. Subgroup members expressed a lack of clarity at different points which we unravelled by facilitated group discussion. The importance of communication of a clear vision is emphasised in management and leadership literature e.g. Kotter (1996) or NHS Leadership Academy (2013).

Echoing the previous work of Holton (2001), Peters and Manz (2007) stressed the importance of an early face-to-face meeting in order to build up trust and depth of relationship in projects which are intended to be primarily virtual. The authors highlighted the irony that virtual working requires the participant to be more sociable, not less. Studying the building of trust and collaboration in virtual teams, Holton (2001) conducted an AR study using Belbin, Bendaly and Keirey's team-building team building tools. She concluded that building in some regular face-to-face meetings helps to build understanding and resolve conflict quicker.

The subgroups which were able to meet during Cycle 1 had made a start on the OLR build whereas the subgroup which had not yet met (LS) felt they could not start until they *had* met. Another reason for the lack of progress of the LS subgroup was that they had to access their training from KN. KN training was distance-learning, thus overcoming travel time and cost issues; however a subgroup member (P1) had been informed that a trainer was not available. The slow start may therefore have been a lack of skills and knowledge, and a consequent lack of confidence. Equally, the delay may have been lack of clarity and agreement on what they are trying to build; the subgroup consistently attributed the delay to a lack of time to meet. Reasons for the slow start could have been explored further by group discussion or by individual interviews. However, since the aim of the study was to look at the process itself and how we, as participants, worked things out, it seemed reasonable to allow another cycle to flow to see how the situation was managed.

The dependence on face-to-face meetings rather than online decision-making was reflective of the way the group functioned previous to the study. In reconsidering my assumptions at the outset of this study I acknowledged that my personal opinion was that the SLPN would benefit from changing to a more virtual and more frequent means of communication. I felt that the existing three meetings a year, with little communication in between, was too slow to respond to the heightened contemporary, contextual political activity described in Chapter 1. I had not initially considered my decision to use AR to be implicitly critical of the status quo, or of being primarily political or emancipatory, as might be described in Critical Theory (Cohen et al 2011). However Herr and Anderson (2005) described being freed of constraining habits through AR as emancipatory, and I

could recognise that I hoped that participation in the specific project of building an OLR would develop new habits of greater online communication.

12.1.5.6 **Summary of findings and questions emerging from Cycle 1**

The first cycle confirmed some pre-phase 2 assumptions whilst challenging others. The tacit support of managers, access to computers, suitable software and availability of free informal local IT support were confirmed. The cycle also identified some potential barriers which would require further cycles of AR to explore.

There was willingness of SLPN members to participate in the OLR development, albeit at different levels. Variation in participation levels was typical of group norms and reflected in the literature describing CoPs and similar groups. Having established a willingness to engage it would be helpful to the understanding of the process of collaborative OLR development to explore underlying motivations. A number of possible motivation theories were suggested, but it would require data from further cycles to indicate a primary explanatory theory.

The apparent absence of overt use of Phase 1 data by one subgroup in decisions highlighted strengths and weaknesses in the research methodology. The cyclic AR process allowed ways of working and output to evolve; increasing the legitimacy of the output. However, the shared working location of one subgroup meant fewer intra-subgroup e-mails resulting in less data on procedural negotiations. This increased reliance on self-reported data from subgroup meetings and reduced the possibility of comparison across subgroups.

A dearth of challenge/critique at the first evaluation meeting (SLPN2) prompted my reflection on group norms and the threat to the AR process if critical discussion was not developed. In addition, a consideration of how members would characterise and label the SLPN was prompted - professional network, CoP or other. A literature review identified characteristics which may be useful in understanding the group, any changes occurring and which could provide theoretical support to facilitate transition to a more virtual way of working.

The transition to a more virtual way of working was crystallised during Cycle 1 as an unspoken political intent on my part; that is, to increase the frequency of group communication in response to contemporary contextual political changes.

12.1.6 Question to address in next cycle

A number of questions emerged from the first cycle, particularly around barriers and researcher role which would need data from several cycles of work to address. The most immediate question seemed to be whether or not, as a group, we could respond to the interim findings of Cycle 1 and change our way of working from reliance on face-to-face meetings, and make greater use of critical discussion.

Individual members would have their own expectations of SLPN and I wondered what difference this made to the norms of the group, such as participation levels. Further, whether that would affect the process of development of the OLR and whether their view of the SLPN would change over the course of the study. I was reluctant to introduce the term CoP without first seeing whether those typical characteristics would emerge from the data. Another cycle of work might provide further data on group characteristics and whether or not they were changing. In addition, individual interviews would be an appropriate method to explore the meaning of SLPN to individuals. If these were to include the changes over the course of the project then they would need to occur in the later cycles.

The main question for Cycle 2 therefore became:

Will the process of collaborative OLR development change the way the group functions?

12.2 Cycle 2 June 2013 – November 2013

12.2.1 Question driving this cycle

Will the process of collaborative OLR development change the way the group functions?

Our intention in Cycle 2 was to gain a better understanding of the group; that is, whether the way of communicating and working would change from the historical group norms of primarily face-to-face operations, to more virtual ways of working. The question of whether this changed the *modus operandi* of the group in the longer term was beyond the time line of this study but would be an interesting follow-up study. It would not be an unreasonable projection since the participating subgroups consisted of 14 members, which included most of the core members of the SLPN.

12.2.2 Planning process

The planning of the second cycle occurred at the end of the SLPN meeting on 25.06.2013 (SLPN2) following the evaluation of the first cycle. For clarity, the action plans and research plans are listed separately, accepting that in reality they are intertwined in the AR methodology.

Action plans:

- LS subgroup planned to:
 - Meet face-to-face, even if some connected virtually.
 - Undertake KN-guided self-learning, in the construction of a community website, accepting only 3 could have editorial control.
 - Use me for theoretical support on OLR design.
- DN subgroup planned to:
 - Change how they allocated time to OLR development.
 - Create a script and storyboards for educational videos.
 - Get editorial rights on the OLR for all subgroup members and use me for technical support/training as able.

- GP subgroup planned to:
 - Continue as per previous cycle in self-directed learning, but using me as technical support when required. Only two of the four chose to have editorial rights.
- All subgroups planned to:
 - Increase inter-subgroup collaboration on content.
 - Have OLR pages ready for first rounds of end-user testing by end of Cycle 2.
 - Give and receive constructive criticism in the group evaluation process.
- Wider SLPN agreed to:
 - Allocate part of SLPN meeting to creation of materials for OLR, to include non-subgroup members.

Research plans

We discussed whether any changes were required to the programme manual (Appendix 19) in order to address the research question of this cycle. I reiterated the data items I would use and that I would bring my interpretations to the group for discussion at the end of the cycle. The only change to process was the increased number of subgroup participants, from 2 to 3 members, to 4 to 5 members. We decided this change would be discussed in a subsequent cycle so that people had time to reflect on why larger subgroups were formed.

I encouraged subgroup members to keep reflective diaries or logs as preparation for their individual interviews in Cycle 3; and to identify potential end-users to evaluate their developed OLR pages, so that I could start the consenting process.

12.2.3 Actions taken in OLR development

There was mixed progress in the subgroups during Cycle 2. The LS subgroup registered with KN and had one face-to-face meeting (of all but one member) and had planned a second meeting; but had not received their training from KN. The DN subgroup had met several times, with me twice, and we had published some OLR pages online. In addition, they had developed a script and booked a date to

film the videos. Similarly, the GP subgroup and I had met twice, developed and published OLR pages, and these were ready for end-user evaluation by the end of Cycle 2. Subgroups had not identified end-users to evaluate their OLR pages.

12.2.4 Data collection, analysis and evaluation of action

The dataset for Cycle 2 included the meeting transcripts and field notes for SLPN2 (June 2013) and SLPN3 (Nov 2013), subgroup feedback sheets at SLPN3, e-mail communications, field notes and the RD. As described for Cycle 1, I initially analysed the dataset for this cycle using framework analysis with the categories of the Logic Model; it was then re-analysed using open thematic analysis, for the reasons previously given. I then took my interpretations to the group for discussion at SLPN3.

12.2.4.1 Themes in Cycle 2

In addition to being consistent with the research approach taken, Cycle 1 data indicated that the role of the researcher would be an important element to consider both in terms of the way of working of the subgroups and wider group, and in terms of modelling the process of collaborative OLR development. Analysis of the SLPN2 transcript (June 2013), in relation to my role as the researcher identified a great many roles. This analysis could be described as a form of personal critical reflection, which is consistent with AR for two reasons. First, that as insider the researcher needs to consider his/her influence on the research, reflexivity being a key feature of AR (McNiff and Whitehead 2009), which, done with critical subjectivity, improves the validity of the research (Ladkin 2007). Second, that when the individual interpretations of the researcher are then taken to participants as collaborators, discussion allows for testing of plausible beliefs (Heron 1996), which is similar to convergent interviewing, where initial analysis from one set of data is questioned in the next to form a new working hypothesis (Dick 2007). This approach can enhance the collective understanding in terms of sense-making of a shared situation (Heron and Reason 2001).

The roles I played as the researcher and the roles others played seemed to be two distinct themes; the latter was more specifically associated with the way the subgroups worked and their relationship to the larger SLPN group. I therefore

coded separately for *roles of the researcher* and *examples of small group working*. These will be described before moving on to time, skills and knowledge, motivation and consideration of new themes.

Roles of the researcher

In the transcript of SLPN2 interpreted that I played multiple roles: researcher, insider, participant, coordinator/organiser, technical support, facilitator, leader, controller, educator, and to some extent regulator (rules observer) (Table 12.2-1).

I then analysed e-mail communication to the subgroups between SLPN2 and SLPN3, for similarities and differences. I interpreted more of a guiding rather than controlling tone. This may have been due to the context, the subgroup e-mails being a more intimate communication than large group meetings, or that I had subconsciously responded to my critical reflection of the SLPN2 meeting.

Table 12.2-1 Roles of researcher identified in transcript of SLPN2 meeting.

Role identified	Source SLPN2 transcript	Example utterance
Researcher	Line 597	<i>R: each of the subgroups will be asked to find 2 or 3 of each job, whichever they've been preparing for... Then I would contact them and say what is involved is looking at this website.</i>
Insider	Line 84	<i>R:as lymphoedema specialists ourselves ... we wanted somewhere to put resources and share resources as well</i>
Participant	Line 440	<i>R: But in terms of building Knowledge Network website I'll be learning with you</i>
Coordinator / organiser	Line 550	<i>R: ...all of you... have been working on pathways ... with SMASAC [a government working party]... so ... it makes sense for it ...to reflect ...each group</i>
Technical support	Line 117	<i>R: ...I've done ... background work on the IT side and ...ended up with.... [the]beginning of the website</i>
Facilitator	Line 744	<i>R: Do you think once ... people have invested more work in each of these pages ...that it's going to be hard to criticise it? ...</i> <i>P8: We should all feel free for comment, I'd be quite happy for someone to comment on.</i>
Leader	Line 134	<i>R: what we really should decide today is something as simple as a colour.</i>
Controller	Line 226	<i>R: I'll let that subgroup tell you about that but ...the suggestion has been for the ... lymphoedema specialist subgroup to... [Here I speak on the subgroup's behalf unnecessarily and physically keep control of the computer].</i>
Educator	Line 580	<i>R: From a ... learning theory point of view, people want to feel that something is reliable ... what that source is and when it was last updated. But also ... people 'satisfice' [a term we discussed as used by Case 2012] ...one thing we've discussed in the subgroups ...was the layered effect of - a quick answer that has its source clear, an option to go in to deeper.. information and then a link to somewhere that is like Knowledge Network or...</i>
Regulator (rule observer)	Line 351	<i>R: ...the permissions for what it's been used for would have to be checked for anything that's used</i>

The balance between providing technical support, being a participant in terms of content development, and a coordinator between groups, was exemplified in an extract from a group e-mail sent to all SLPN members a week before SLPN3.

Both subgroups have been working, and are still working, on the [generalists'] website and the Specialist subgroup are busy with Knowledge Network - each group will report next week at SLPN[3]. In the meantime I have done a little bit of tidying on the website Please have a look at how the different pages between Doctors pages and Community Nurses pages interlink (accepting that people are still working on content). In particular can you look at the flowchart on Differential Diagnosis because I'm trying to do it from a mixture of others, and let me know if you feel anything is wrong there, bearing in mind it's aimed principally at GPs.

e-mail/researcher-to-subgroups/31.10.2013.

In addition, the RD during Cycle 2 captured the dilemma of balancing the time between a project management role and the activities I needed to undertake as a researcher.

Balancing time and attention between the project management side of the study and the researcher part is difficult at times; project management tending to win out because it is more immediate and can be done in short bursts.

RD 22.09.2013

Being an insider meant understanding the time pressures on my colleagues and feeling reticent to delegate tasks, but it sometimes created a dilemma with my research agenda; the example given below is in relation to concerns regarding the liability of the group in relation to information on the OLR and finding a suitable liability statement. Archambault et al (2012) highlighted that liability of participants in collaboratively-built health information was an area where there is lack of legal clarity. I referred to JISC which is a UK charity that provides resources and support, including legal information, to enable good quality use of technology in Higher and Further education (www.jisc.ac.uk).

There is a lot of information on [the] JISC [website] for me to read, getting the time is main issue. But then this is a project issue not a research issue so perhaps it should be delegated - the difficult thing is that I know everyone else is just as busy.

RD 23.09.2013

There was a similar dilemma between the project management role and being an educator. As the latter I wanted to give my colleagues time to explore and learn but, for example, I relied on them to tell me if they were struggling with the technology. Toward the end of Cycle 2 the DN subgroup participants showed me how slow their computers were; which prompted both an action response (consideration of re-design of the OLR) and a research question (why were these participants reluctant to ask for help?). My field note recorded:

I find the work is made extremely tedious by the slowness of their hardware and some operations seeming to be blocked by their local NHS firewall. ...it's difficult to tell if it is blocked or simply slow. However, if others in the NHS would be accessing the finished OLR on computers this slow then perhaps we ought to be using as few links as possible? We have already removed photographs for now with this in mind. I think it will be important to get end-users to test the website from different access points to see if there is a difference. ... It's clear that they feel that they are working hard on this but it's a bit frustrating for me that they seem to struggle on within group rather than asking questions. I don't know whether there is something about the way I set this project up and described our roles within it... or whether it is just their way of working. Discussing roles at the next SLPN meeting [SLPN3] may help answer this.

DN-subgroup-meeting-field-note/30.10.2013

The participants' perception of my role(s), up to that point, was an aspect of discussion at SLPN3 (Nov 2013). Members were not given the above descriptors, but where they did not emerge, I probed with some terms from Cycle 2 and some new (dummy) terms. Participants described a mixture of roles and qualities. The main roles described (and whether confirming or contesting previous data) were:

- technical support (confirming)
- schedule keeper and ‘prompt’, (which may compare to coordinator/organiser)
- facilitator (confirming)
- guide/advisor (contesting the controller descriptor above)

Of particular value to participants was my being ‘a good support’, referring predominantly to technical support. This was associated with accessibility and availability to provide that support.

P8: Well I think you’re there as a good support and if we wanted you to come over that wouldn’t be an inconvenience for you, you would be quite eager and quite glad to do that

R: ... technical support ...not emotional support?

P8: aye but it’s mostly for the hyperlinks and the links ...

SLPN3/724/05.11.2013

Descriptions were often associated with the competing time pressures the participants were under, so that prompts for example, helped prioritise tasks. Similarly, guidance on how to do something, or how to find a resource, was perceived as timesaving. Some descriptors I suggested were contested, such as champion (as is commonly used in NHS literature) and driver (driving or pushing); the consensus rather being on ‘facilitating’ and ‘guiding’, confirming a descriptor I had interpreted in the analysis of the interim e-mails.

P6: ...because when you e mail us ‘will you have a look at this website’, it’s almost a prompt... It would have taken me a long time to think what would be a good thing to look at... it’s been really useful ...because it cuts out all that work too. So it’s lots of different things but ...sort of guidance almost?

R: ... is that the same as ... in some of the NHS stuff they talk about ‘champions’? People championing an idea through, is that the same thing or is that a slightly different thing?

P19: you sound like a ‘facilitator’

R: yes?

P6: because I think it's something that we would all like to be doing so it's not as though we need that push along it's more just to facilitate it and keep reminding us that

R: ...so facilitating is more correct than driving.

SLPN3/731/05.11.2013.

The roles of researcher and researcher-as-participant only emerged in discussions in terms of ambiguity; one member (P5) suggesting that greater clarity of role at the start would have been better, as she was unsure of the researcher-participant boundary and was afraid of 'spoiling' the research. Such role ambiguity is a recognised difficulty in AR (Coghlan and Shani 2005).

P5: at the beginning I was a bit unsure if you were part of the group or just coordinating all the groups and I didn't want to put you in a position ...and in case you couldn't use that information for the whole thing.

SLPN3/788/05.11.2013

The roles of educator, leader, insider and regulator did not emerge explicitly. However, in a post-meeting critical-analysis of the meeting transcript (SLPN3), I interpreted that I again played all four of these roles during the meeting:

- leader role (clarifying purpose (Kotter 1996))

R: So you're still seeing it as a place that is a repository for teachers? ... And then as a 'this is our safe space as specialists to share our concerns or practice'... Is that the two main ways you're still thinking of it...?

SLPN3/71/05.11.2013

- insider

R: ...when we're nearer the end of the project as a group we'd have to decide how many people are looking after it at a time ...

SLPN3/585/05.11.2013

- educator (and regulator)

R: ...so there is ...a Creative Commons license that you can do that doesn't cost anything but is like a copyright except that you can say how people can use it.

SLPN3/133/05.11.2013

Also noted in my dialogue were more subtle social leadership/group skills, such as acknowledging particular skills and knowledge in others, and being comfortable to acknowledge deficits in my own knowledge. These are criteria of emotional intelligence, as described by Mayer, Salovey and Caruso (2004), and as such are described as abilities and traits rather than a distinct role. The abilities and traits of leaders have been studied in leadership literature for a long time but the link with emotional intelligence in particular is made in contemporary literature, both leader-centric (e.g. Transformative leadership) or follower-centric (e.g. Adaptive leadership) (Northouse 2016). These social skills were therefore noted in case they became significant factors. Zuber-Skerritt and Perry (2002) claim that the process of AR itself fosters what they term the soft skills of motivating, creating cooperation and re-defining values and beliefs and as such develops valuable leadership skills in the participants.

The field note written immediately after SLPN3 recorded the generally positive tone of the discussion and reflected my awareness that perceptions could change through different stages of the study, and that a facilitator/leader would need to be aware of such possible changes.

It may be so positive now, at this project stage, because we are just getting past the frustrations of the initial steep learning curve and getting to the bit where they can be creative and start to see the output; it may be that things will be less jolly again when feedback and critique (criticism possibly) of their creation starts coming in. This presumably reflects the sigmoid curve used so often to describe the change process; or perhaps stages of small group development - Tuckman and Jensen's group stages (forming, storming, norming, performing and adjourning) [Tuckman and Jensen 1977].

Researcher-field-note/05.11.2013

The findings of Cycle 2 suggest that the role(s) taken by the researcher influence the way of working of other participants but that critical reflection can be a useful tool for personal cognisance of influence and for open discussion.

Small group working

The data provided practical descriptions of how subgroups worked and communicated during these early cycles. Only a few roles for themselves were tentatively suggested by participants.

Face-to-face rather than virtual-working norms were confirmed, but there was some asynchronous online work developing, where one participant was prepared to lead by suggesting material and uploading it.

P5: ..xxxx [P3] has identified ...[content] could be linked in there, and sent it round and then she's ...actually done it [put it online] ...and that's useful to look back and see how she did it and try and work it out and then have to go...

R: so is she taking a kind of leadership role there? or a...

P5: I think maybe ... But she communicates with us by e mail to make sure that were all happy with it.

SLPN3/665/05.11.2013

When asked at SLPN3 (Nov 2013) whether people had taken specific roles within the subgroups, only the DN subgroup had pre-emptively nominated a lead, whose role would be to keep a log of activities and communicate with its more remote member. In the LS subgroup one member (P1) had personally decided to keep a reflective log of the subgroup's activities. Generally, work was organised by task rather than by roles, although the role of reviewer was described by more than one subgroup.

P6: xxxx [P10] has been our sort of reviewer at the moment.

P1: yes aha because he's not managed to come to any of our meetings

P6: He's been the one that when we've done something we pass it back to him, does this make sense and if we've missed anything...

SLPN3/645/05.11.2013

In summary, data coded for small group working identified a task-oriented rather than role-oriented way of working, with only one common role, that of reviewer.

Time and Motivation

Much of the Cycle 2 data coded for the theme of time confirmed the findings of Cycle 1 (time as limited physical resource and related to skills and knowledge), but was intertwined with motivation. Particular findings in Cycle 2 were the negative effect on progress, and on learning, of long gaps between OLR sessions, and the increasing frustration with barriers to progress that were beyond their control. However, the motivation from the potential end value of the OLR was overcoming the negative effect of lack of time. DN subgroup member, P8, articulated these problems during the evaluation of Cycle 2.

P8: ...a lot of problems with IT ..our old computers. ... everything takes so long that you actually think the page is not changing it's taken so long. [And]...the time, time for the four of us to get together...we found that when we had done maybe an hour or two's work on it, [then] it was maybe 5 - 6 weeks and when we got together again we actually had forgotten so we had to go over what we were doing and what we had planned... ...At the end, as much as...you do need time for it, I think it will be very valuable for district nurses to use.

SLPN3/348/05.11.2013

The value of the OLR to participants as a simple-to-use point of reference was the focus of much positive talk or the *caring talk* (Holton 2001) described in Cycle 1 (section 12.1.4.2). This perceived value seemed to have a motivating effect.

P16, P6 and others: It looks really good. It looks easy to use.

P8: Do you think so?

P6: very clear so I thought, well I can do it so that's good but yes I like the way it goes on words and links it through, not huge big chunks of text either so it's really easy to find.

SLPN3/391/05.11.2013

In addition, SLPN members who were not part of subgroups could see what had been developed and gave positive feedback regarding the OLR's usefulness, participating with development suggestions.

P16: I can see that this would be a really useful resource for some of the people who can't come here, so Orkney, Shetland, the Western Isles, ...maybe it's worth asking some of these people what would be helpful for them.

SLPN3/103/05.11.2013

For LS subgroup member P6 an issue remained regarding the sharing of teaching resources amongst specialists, which echoed the reservations regarding photographs expressed by DN subgroup member P8 in Cycle 1. Such concern would be likely to have a negative effect on motivation to participate in development of the LS resource in KN.

P6:...one of the things we had originally thought, if you had presentations that you usually use with district nurses or you use an educational tool [that] could that go on there but if it does I think that we'd all want to know how's it getting protected, how do we know where it's going from there? ...in particular with photos, even with the patients' consent I think there is still always this feeling that you only want them used appropriately so how do we monitor that, and I'm not 100% sure personally how we do that at the moment.

SLPN3/38/05.11.2013

There were no specific data in Cycle 2 to differentiate whether the lack of trust was with each other or with the security of the technology.

Skills and Knowledge

In Cycle 2 the data themed as skills and knowledge related to a) the subgroup members, b) the non-subgroup members and c) my role as researcher.

a) There was a clear difference in the progress made by different subgroups; in particular, the difference between the LS subgroup, which relied on an external provider (KN) for their training, and the independent DN and GP subgroups. At the evaluation of Cycle 2 (SLPN3, Nov 2013), LS subgroup members expressed frustration but expected ‘all to become clear’ when they received their training from KN. The DN subgroup described their plans for OLR content and their engagement with the research process, despite the problem of slow computers.

We also plan in December to identify 2-3 community nurses and one independent lymphoedema specialist who are prepared to be interviewed on their opinion, for the feedback on the pages of the [sub]-group. We discussed that it would be useful for these to be nurses with different levels of experience of chronic oedema /lymphoedema...

P8/SLPN3/383/05.11.2013

One GP subgroup member (P5) articulated how difficult it was to begin self-directed learning in the use of the computer software and the importance, in her view, of some initial education. She addressed this by meeting a subgroup colleague and myself for some initial shared learning and then was able to conduct OLR development independently.

I kept waiting for... for somebody to sound off ‘how do I get in here and how do you do this’ so wasted a bit of time then. And then realised xxx[P3] was in the same boat so we both met up with xxx[R] ... and we worked through it and that was really valuable because to do it there and then and go back and practice it and see things get developed on the page that really helps. So you really need that bit of education...

P5/SLPN3/402/05.11.2013

The preference for face-to-face was echoed by the LS subgroup members, who felt that their progress had been slow because they wanted to meet face-to-face to work together through the initial hurdle of starting online.

... it's definitely a lot easier I think if you can meet up ... when you go on it at the moment you just look at it, ... and it's just a blank page and you think where do I even start? How would we lay this out? ... So ...from our side of things it feels really slow ...and because we've not done it before, you [need] that, almost holding hands, to put it on at first.

P6/SLPN3/606/05.11.2013

Exploring the participants' need to meet face-to-face, there was a clear link between this need and the perceived level of IT-related skill and knowledge, and that learning was initially a social process (e.g. *people in the room*). One member (P6) acknowledged the potential to work more virtually as confidence increased.

R: ...it sounds as though certainly initially, that face-to-face contact is really important to people?

P6: ...because its new, ... if it was something we'd all done before you'd be quite happy to post something on and put it up and then e-mail people ... and say can you have a look at it and see what you think but ...looking at it you just think where do I start with this. Whereas it's much easier when there's people in the room to play with this

P8: same as us, to choose certain words

P6: ...whereas ...as you got more confident you probably wouldn't need you all there together...

SLPN3/708/05.11.2013

b) The SLPN meetings proved to be opportunity for members who were not part of the subgroups to participate and learn, but only if group jargon (Wenger 1998) did not become exclusive. One non-subgroup member (P18) expressed a desire to learn from subgroup activities but that their use of jargon was creating a barrier.

P18: I'm a bit confused by all the technology and how you're doing all the links and things ... Even how you are talking about how you are doing the things, I can't quite grasp that, ...and I'm wanting to know how to do it..

SLPN3/800/05.11.2013

I was unsure at the start of the study whether there would be much learning for those not involved in subgroups. When I had asked about this at SLPN2 (June 2013) the response was ambivalent. Although this was not specifically stated as a research question, as an educator I was interested in learning by non-subgroup members and whether, if present, it reflected the situated learning described in CoP literature (Lave and Wenger 1991).

c) As researcher, my knowledge and skills were developing throughout the study, but analysis of data from Cycle 2 showed this to be a demanding period, as I pursued informal support regarding the technical and governance side of the project. For example, the content planned by the DN subgroup relied on numerous photographs and film-clips. Despite the earlier checks of various NHS computer firewalls, new barriers had emerged which would make the functionality poor on the OLR e.g. photographs and films would not display properly (Field note, 07.08.2013). We therefore needed to investigate whether this was a local or national issue and whether it was surmountable. Members of the DN subgroup therefore used their local IT support processes and I sought advice from educators and website developers who were willing to give free informal support. Some issues were quite simple to resolve e.g. having film-clips hyperlinked directly from a server rather than being downloaded from transfer media such as Dropbox. Other issues were considerably more complex, such as copyright and liability.

I spoke to an IT technician who brought up a number of issues we needed to make sure we have addressed in the build/security of the OLR. This increased my anxiety levels considerably, worried that I really was out of my depth and had taken my colleagues down a bad road too. After considering it for some days, I discussed it with my critical friends and I then had an informal chat with another IT person who was more reassuring and pragmatic. I followed up their suggestions exploring liability etc with JISC-legal website, and the Terms and Conditions of other similar websites/OLRs; and read issues around liability on discussion forums etc.

RD 06.09.2013

When I was considering the feasibility of the study a year earlier, I had established a reasonable overview of the related legal issues. Nevertheless, in Cycle 2 I found that, faced with specific questions, I was uncertain. I reflected that I felt out of my depth at times and was concerned about the implications for my colleagues (RD 06.09.2013). What I found was that informal face-to-face IT support could be variable in quality and needed just as much awareness of potential bias as any information source e.g. one adviser recommended that the group employ their services to resolve concerns. An advantage of the collaborative process was that many people could explore different avenues concurrently and compare findings. In addition, I found that there was high quality information available online, such as on www.jisc.ac.uk and www.creativecommons.org, to which I could then refer the group when questions arose.

In analysing the data I noted that this period, where my skills and knowledge were most overtly challenged, was also the period I had first recorded that time management was a challenge in balancing my roles as researcher and project manager (RD 23.09.2013). I noted that this seemed to reflect the data from subgroup participants. This raised the question of whether time was expressed as a greater barrier when there was a perceived gap in skills and knowledge, or whether it was a more objective concept i.e. time being more efficiently used when one has sufficient skills and knowledge; or indeed whether the data of this study showed both. If this relationship was seen in the subsequent data then a process model might include a relationship between learning and perception of time.

New themes emerging

There were no new emergent themes within Cycle 2.

12.2.4.2 Summary of evaluation of Cycle 2

During this second cycle progress on the OLR had been stifled for one subgroup because of the lack of availability of training by KN. For the remaining two subgroups, some progress was made particularly when initiated by hands-on, face-to-face co-learning sessions with the researcher and where one subgroup member took the first step of uploading content to the OLR. With individual interviews of participants and feedback from end-users planned for the Cycle 3, no changes to

the overall plan of action were suggested. The questions pursued within subsequent cycles were however were shaped by the findings up to this point in the study.

Findings of note were:

- Roles: the multiple roles of the researcher caused dilemmas and were perceived differently by researcher and other participants.
- Small group working: there were some indicators of CoP behaviour, particularly among subgroup members.
- Motivation and Time:
 - the anticipated value of the OLR and group approval seemed to increase motivation to overcome time barriers but lack of trust (whether in each other or in the security of technology) could negatively affect motivation;
 - interpreting the data for the themes of time and motivation informed the question of what type of group the SLPN is;
 - however, time as a theme was interwoven with each of the other themes.
- Skills and Knowledge (learning):
 - time barriers were more likely to be expressed when participants, including the researcher, perceived there to be a lot to learn to achieve competency;
 - there was anticipation that the dependency on face-to-face meetings would reduce as competency and confidence increased.

Taking a view across all the themes, there were factors within each, which at times hindered or facilitated the process of development. Further exploration of these facilitators and barriers, and how they were inter-related, was warranted.

12.2.5 Specifying the learning: discussion of Cycle 2.

In this cycle we sought to gain a better understanding of the way the SLPN worked, and whether collaboration on the OLR changed this. Allied to this was whether or not the SLPN could be categorised by the way it worked to the conceptual framework of CoP, or other. One approach to understanding how groups work is to look at members' roles. Only a few within-subgroup roles were tentatively noted by the participants - leader and reviewer (in Cycle 2) and resource investigator (Cycle 1). Instead the subgroups described being task-oriented, so that any member might undertake a task. The use of Belbin team roles (Belbin 1996), which I had considered, seemed inconsistent with the experience of the group. There was considerably more data available to consider the role of the researcher.

12.2.5.1 The role of the researcher in the first two cycles

The first two cycles of the study confirmed the multiple roles of the researcher described in AR literature (O'Brien 1998; Trondsen and Sandaunet 2009; Herr and Anderson 2005) and set them within the context of this study. This multiplicity could be compared with the role of a project manager in IT or information services (IS) literature (e.g. Burdman 1999) and may relate to contemporary leadership theories. However, the implication for a model of the process of collaborative OLR development by HCPs was less clear at this point. It was also of interest whether or not the roles identified for the researcher would change as the action cycles progressed (Zuber-Skerritt and Perry 2002).

The question of how the researcher's role might be described in a model for the development of an OLR was therefore fed into the third and subsequent research cycles. This came within the broader question of what facilitates and hinders the process and what are the key components of the model.

12.2.5.2 Skills and knowledge – time and peer support

In a project where additional time resource had not been allocated, the reporting of time pressure was not surprising but notably, it was particularly expressed when participants felt there was a great deal to learn. Cognitive Load Theory (CLT) (Sweller 1988) may offer some explanation. In relation to the early cycles of

this study, there was a great deal of new information to process which was outside the participants' usual clinical expertise and domain. Sweller (1988) argued that where a person has some expertise in the particular (or very similar) task, then they have a schema which can help reduce the cognitive load (perceived mental effort). In contrast, novices, who do not have existing relevant schema have to incorporate the multiple interacting elements of the complex task, which creates a higher perceived effort. My predominating instructional mode was based on my assumption that best learning would come from giving only light guidance and allowing self-discovery but may have increased the mental burden for some participants.

What was known from reconnaissance and Cycle 1 was that the subgroup members were novices at OLR development but had experiences of other group projects e.g. preparation of clinical information for political reports and in-service training. In addition, they had experience of using e-mail and some used other online tools e.g. Dropbox. What was unknown was how much they could relate their experience to the current undertaking, that is, reduce the cognitive load by working from familiar schema. Peer collaboration can alleviate individual cognitive load by the sharing of tasks (Schunk 2012) and, at least for some within the group, a norm of sharing clinical problems existed. Therefore the dominating desire for a face-to-face meeting of subgroups may have come from the drive to reduce the cognitive load.

The implication of considering CLT as explanation was two-fold. First, reports of time pressures should reduce because there would be improvement in efficiency from learning how to complete component tasks, and cognitive load would reduce as participants became more familiar with OLR development processes. Second, a recommendation of the study might be to use some of the instructional techniques developed in cognisance of CLT (van Merriënboer and Sweller 2010) in the set up and initial phase of collaborative OLR development, such as giving worked examples, giving timely technology instructions, and breaking down complex tasks into smaller, simpler tasks. In addition, extending CLT to the users of the OLR prompts consideration of guidelines designed to incorporate available evidence on instructional theory into the design of multimodal learning tools (MMLT) such as those suggested by Grunwald and Corsbie-Massey (2006). CLT does not provide a complete view of cognitive load in any situation (Young, Van

Merriënboer, Durning et al 2014), but complements other theories, such as motivation theories like Self-Determination Theory (SDT) in that, for example, a negative effect from externally-set goals would be consistent with both theories.

Increased time in real terms was not possible, but with understanding of CLT, and designing the initial training accordingly, future groups may be able to reduce the impact of limited time for the OLR development.

12.2.5.3 Motivation

In SDT, Deci and Ryan (1985; 1987; 2000) described the negative effect of deadlines on intrinsic motivation. These studies have since been repeated and validated in a number of different contexts and SDT is acknowledged as one of the major theories in the psychology of motivation (Ryan and Deci 2000; Ten Cate, Kusurkar, Williams 2011). The frustration with time pressures reported in the first two cycles implied that there was motivation to work on the OLR. This may have been intrinsic (e.g. a wish to learn) or extrinsic (and integrated e.g. the aim of the OLR is the same as my aim), but the motivation was essentially autonomous since participation was voluntary and, as such, the locus of control was internal. However, the limitation on time (deadlines) created an external locus of control. Sustained behaviour and greater learning will occur with intrinsic rather than extrinsic motivation (Ryan and Deci 2000). Since sustainability and learning were ambitions of this study, then maximising intrinsic motivation and internal sense of control (autonomy) was beneficial.

Notwithstanding the time restrictions, progress was made on the OLR, to the point where two sections were ready for the first round of end-user testing. After the first cycle a number of motivation theories were suggested as being worthy of consideration (section 12.1.5.2.). The second cycle confirmed some findings of the first, such as the anticipated value of the OLR and a possible moderating effect of lack of trust. What the Cycle 2 findings added was that group approval (social/peer approval) was a noted feature of the meetings. All motivation theories named in the previous cycle can be categorised as socio-psychological. However most only include constructs from within the individual's own psyche; external and contextual factors are rarely featured (Darnton 2008). Since the aim was to model the process it seems reasonable that the external and contextual

may be significant. In addition, all of those named except for SDT (Ryan and Deci 2000) discussed motivation as a unitary concept, producing behaviour or not. The study to date had already shown that motivation was present. What seemed of greater significance was the *nature* of the motivation, as described by SDT, particularly in relation to the sustainability of the study and the learning from it. It was unlikely there would be further illumination of motivations from group communication data used up to this point; therefore, I planned to ask a question about motivation in individual interviews, in the next cycles.

12.2.5.4 Community of practice as conceptual framework

The task-oriented, lack of roles or hierarchy, identified in the small group working data indicated an egalitarian structure to the group. This might align with descriptions of a Professional Network or with Brown and Duguid's description of a CoP (Brown and Duguid 1991).

The commonality of using someone as reviewer of content would be consistent with ideas of legitimisation (Wenger 1998) and social approval (motivation theories, as above). Similarly, the process of approval of draft sections of the OLR when brought to the larger SLPN group represented a shared discourse and an ability to assess appropriateness of actions and products suggestive of a CoP (see section 12.1.5) (Wenger 1998). Further, the awareness of each other's workload and taking responsibility for not making life harder for another member of the CoP, as described in the data above, is described as CoP behaviour (*ibid*).

It is possible that the indicators of CoP would apply to members of the subgroups but not to non-subgroup members. Alternatively, it may apply to the core members who attended the meetings but not to those who did not, whether engaged in a subgroup or not. Adding to the complexity is that key elements of CoP theory are participation and reification (making meaning explicit) (Wenger 1998). The OLR might be described as a reification of the SLPN, in that it is an object which expresses a shared meaning of the group. The increased participation on such an object might be expected to increase the sense of identity and belonging that a member has to the group (Handley et al 2006).

Identity, belonging and relatedness are characteristics described in both CoP and SDT theory. The question of whether participants felt a sense of belonging to the group and/or if this had changed since participating in the OLR study were therefore added to planned interviews.

12.2.5.5 Time as an interwoven concept

As in the first cycle, time was described as both objective resource (that was in short supply) and as a subjective perception, where time-pressures were particularly related to the level of IT-related skill and knowledge.

12.2.5.6 Summary of findings and questions emerging from Cycle 2

The principle question for Cycle 2 was whether the process of OLR development would change the way the group functioned. In asking this question we also sought better understanding of the group in relation to group theories. The findings indicate that although the group does not call itself a CoP, many of the indicators would fit the way it operates. There was some early indication that a more virtual way of working was developing but that this had been hampered by a lack of confidence in relevant skills and knowledge. In terms of learning theory Cognitive Load and Situational Learning were carried forward as potential explanatory theories. In addition, motivation to participate was present but moderated by lack of time and, for some, an apparent lack of trust. A greater understanding of the nature of the motivation may inform the process model. As researcher I played a multitude of roles but was primarily seen as facilitator and guide by other participants, so contemporary leadership theory may further inform this role within a model. Overall, the OLR progress was consistently perceived by subgroup participants to be slow, and although time was an issue that intertwined all themes, it was felt that a greater understanding of the facilitators and barriers would illuminate a process model further. In relation to the asset-constrained context, the assets required for OLR development seem to include some which are quite tangible e.g. access to suitable computers and software (Cycle 1), and others which are less tangible e.g. motivation (Cycle 2).

12.2.6 Question to address in next cycle

The main question for the next cycle therefore became:

What are the facilitators and barriers to the development of the OLR?

12.3 Cycle 3 November 2013 – March 2014

12.3.1 Question driving this cycle

What are the facilitators and barriers to the development of the OLR?

In the first two AR cycles we learnt that the process of collaborative OLR development *within existing resources* relied on some assets that could be described as tangible and others, less tangible. The up-front requirements included access to well-functioning computers, permission of managers, willing participants, having learning resources (to share) and informal IT support. These were underpinned by a proven educational need to address, a negotiated iterative plan and the willingness of participants to re-allocate the time that they would normally have for teaching/in-service training. What emerged through AR cycles 1 and 2 was that the process of OLR development had factors that seemed to facilitate or hinder the process (barriers). The main focus of this third cycle was therefore to gain a better understanding of these factors.

Of contextual significance during this period was that a report on lymphoedema management in Scotland, incorporating the findings of Phase 1 of this study, was presented at Parliament, November 2013 (Scottish Government 2013a). This was anticipated to produce a response by health boards during the following year, 2014, which may have increased pressure on generalist HCPs to manage lymphoedema more effectively.

12.3.2 Planning process

The plans for Cycle 3 were formed and agreed at the end of SLPN3 (Nov 2013).

Action plans:

- LS subgroup planned to:
 - Receive their training on the KN software.
 - Build a community space as an OLR for specialists in KN and then link to it from the generalists' OLR created by the other two subgroups

- Establish how members would join the password-controlled community.
- DN subgroup planned to:
 - Film training videos, edit and upload them to the OLR
- Both DN and GP subgroups planned to:
 - Complete ongoing written content
 - Identify end-users to test their OLR pages
 - Discuss, as a subgroup, the feedback received from end-users and make changes accordingly.
- Wider SLPN agreed to
 - Undertake a detailed review of the programme manual (Appendix 19) to discuss whether, how and why the process of OLR development had evolved from the plan initially envisaged.

Research plans

Facilitators and barriers can be at group or individual level therefore the research plans for this cycle included both levels of data.

In the evaluation of the previous cycle I concluded that interviews would be a useful means of exploring the individual experience of SLPN members. In particular, experiences in relation to facilitators and barriers, motivation and roles. Two semi-structured interview templates were used; one for subgroup members (Appendix 16) and one for non-subgroup members (Appendix 17). The expectation was that interview templates would change in response to ongoing findings.

The plan during this cycle was to interview at least two non-subgroup members, four subgroup members and six end-users. Of the end-users two would be LS and four would be other professions. The reason for asking LS to be end-users and review the GP and DN pages was that they would also be users, i.e. they would be more likely to refer HCP to those pages if satisfied with the content. Interviews were planned across Cycles 3, 4 and 5 so that information was feeding in at each evaluation. The strengths and weaknesses of this approach will be discussed in my reflection on the study (section 13.2).

12.3.3 Actions taken in OLR development

The LS subgroup members received training from KN and were able to create and edit a new password-protected specialists' community OLR. Communication was mainly by e-mail, but one face-to-face meeting occurred. Having initially planned to populate quite a bit of the OLR themselves, they re-considered. Based on the collaborative purpose of the LS community area, they felt it appropriate to get other non-core SLPN members involved in populating it from the start, as reflected in their feedback to SLPN (Appendix 22). Therefore, an online framework was created with a sample of learning resources in each section.

My involvement with the LS subgroup at this stage was mainly feeding in theoretical ideas about how to engage members in virtual communities, since this part of the OLR would be a virtual community for LS. I synthesised the findings of a review of literature from 2006 - 2013, identified through EBSCO Host using health, psychology, professional development and education databases, and including only English language peer reviewed papers. Of particular interest were studies which had looked at the change of traditional CoP or face-to-face networks to virtual (or partially virtual) groups. The main findings were the concepts of posters and lurkers in relation to contribution to online forums i.e. those who post comments and those who only read forums, (Carroll et al 2009; Liao and Chou 2012); and knowledge-shapers and lurkers in terms of creating new knowledge (Yates, et al 2010). In addition, I shared the conclusions of an extensive scoping review in relation to knowledge transfer from collaborative writing applications (CWA) in health care (Archambault, van de Belt, Grajales, et al 2013). Acknowledging concerns regarding publication bias in terms of the studies included, overall the Archambault et al (2013) review seemed robust and the facilitators and barriers to engagement in CWA were noted. Barriers included a lack of familiarity with the technology, time and workload demand, lack of self-efficacy, access to the technology/software, worry about the quality of information shared, and legal concerns. Facilitators were noted to be an engaged community and a moderator. The cross-over with studies into VCoP was noted by the authors. Such findings were used as discussion points in subgroup meetings and allowed an understanding of the level of theoretical support for practical decisions. For example, in response to the literature presented, the LS subgroup

asked SLPN members if they would engage with a discussion forum. Exploration of the barriers identified would be added to forthcoming interviews.

An emergent issue was the need for a process of application for access to the SLPN member-only resources, which required the group to make more explicit the criteria for membership. This became a significant issue as will be explained (see facilitators and barriers, section 12.3.4.3). Ultimately, it affected the constitution of the SLPN.

The DN subgroup, with me acting as intermediary, successfully collaborated with the local university to produce two educational films for the DN pages of the OLR. Other sections were also completed. All meetings were face-to-face, except for one member (P9), who had effectively become a reviewer of content for the group. Participation levels were later explored in interviews with subgroup members. My involvement remained predominantly as technical advisor as their confidence with the software increased. End-user feedback comments were received only shortly before SLPN4, therefore the DN subgroup did not have time to make responsive changes. They therefore used the opportunity to discuss the feedback with the wider SLPN membership.

The GP subgroup continued to produce pages directly related to the findings of Phase 1 of this study, e.g. producing a directory of lymphoedema services and printable information for patients. Work on the GP pages of the OLR was entirely remote by this stage. My involvement related to both content and technical advice. This subgroup's stated plan, informed by discussion of information seeking theories (Case 2012), was to create an initial layer based on quick-information-giving, then receiving feedback on that before going on to create a more detailed educational layer. Feedback from workplace doctors had reinforced the quick-answer approach. In addition, feedback indicated that whilst search facilitates were important to usability, doctors may be reluctant to expose a lack of knowledge in discussion forums, echoing Carroll et al (2009). Consequently, a search function was added to the OLR, but a discussion forum was only added to the LS section.

There were delays in availability of HCP end-users for OLR testing and for interview. An overall chart of timing was shown previously in Table 11.4-1.

All interviews of OLR end-users were by telephone and took a maximum of 15 minutes. Concurrent field notes were written, interviews were not audio-recorded since their purpose was to inform subgroup members regarding the usability and relevance of the reviewed OLR content. Whilst this was crucial to the overall purpose of the project, the end-user data did not require detailed analysis of meaning. Only four end-users were interviewed within the period, as the remaining two (both GPs) were only available after SLPN4 (March 2014).

12.3.4 Data collection, analysis and evaluation of action

12.3.4.1 Data collection and analysis

Data regarding actions taken during Cycle 3 were in the subgroup feedback sheets, meeting logs/diaries and e-mails during this period. The feedback sheets particularly demonstrated the iterative nature of the AR process (e.g. Appendix 22). Open thematic analysis on the feedback sheets included reference back to members for clarification, where records were brief. These group data were compared to individual data, but not merged (see Section 11.4.5).

Interviews of SLPN members (subgroup and non-subgroup members) took up to 30 minutes and could be in-person or by telephone, at their preference, and were audio-recorded. Two non-subgroup members (P16, P18) and five subgroup members, rather than four, were interviewed in this period (P1, P6, P11, P12 and P15). The change was because P12 and P15 requested to be interviewed together as they job-share and had worked in tandem on the project. Since the ethical approval for this study described individual interviews, I checked with the approving ethics committee that this did not require a formal extension before proceeding with the joint interview. In doing so, I considered whether the participants stimulated or prejudiced each other's responses. To mitigate against this, at the end of the interview, I asked the participants independently whether they wanted to add or clarify any point. In addition, each had an opportunity to comment independently on the interview transcript.

To stimulate dialectical analysis (12.4.5.3 and 13.3.4.2), a week before SLPN4 I sent all SLPN members a list of the key themes and opinions expressed in the

interviews (anonymised) and findings from other data items, making clear which came from a subgroup member interview and which came from a non-subgroup member. I gave a synopsis of my interpretation and gave SLPN members specific questions to consider before the meeting. I encouraged them to challenge my interpretation. Those unable to attend the meeting could contribute comments by e-mail.

12.3.4.2 **Group discussion - cultivating dialectic analysis**

During Cycle 2 I had been concerned that inadequate critique of the findings of each cycle would undermine the collaborative meaning-making intended in the dialectic analysis. Distributing my interpretation of Cycle 3 data to the SLPN members a week before the meeting, as described above, was in contrast to Cycle 2, where I had introduced a particular theme (“roles”), facilitated discussion of members’ interpretation of their own experiences, and then compared these to my interpretation of the data, to come up with a convergent view. Whilst I felt this had given members an opportunity to present alternative interpretations of that specific theme, it left many other themes unattended and did not give members time to reflect critically. In Cycle 3 my aim was therefore to give members time to consider and to challenge my interpretations. In so doing, I hoped to encourage more divergent thinking and alternative interpretations of the data and to maximise the learning from the research.

‘Time’ was a theme interwoven within the interpretations I gave SLPN members to consider - specifically this was related to: a) prescribed time, that is whether I, as researcher, should have told participants at the outset how much time they should spend each week on the study; and b) ways of working.

a) Regarding prescribed time, I highlighted an apparent contradiction that had emerged in interviews. On the one hand, a participant would have preferred more external structure and to know more specifically how much time should be committed to OLR development so that they could plan their diary. On the other hand, this participant acknowledged that being asked to set aside specific amount of time every week in advance would probably have deterred them from participating; with which her peer concurred.

P12: I think you could argue that either way.....had you asked me back then I probably would think 'oh it's a bit of a commitment' but definitely now I'd be saying 'I commit to that....

P15: that's what I feel as well

P12 and P15/int/47/30.01.2014²

Given that the time spent on the study was under their individual control, I suggested that one interpretation was that they felt externally-set time commitments, as opposed to self-determined ones, held greater legitimacy to others and perhaps to themselves; giving the OLR priority over competing demands at work. Possibly, there was also a sense of duty to the group once committed, invoking feelings of guilt if tasks were not completed, as expressed by participants P12, P15 and P1.

P12: ...you're always racked with guilt that you haven't given it the time and its pushed to the back....I wouldn't give it up because I'd feel as though it I'm letting it [the project] down ...

P12 and P15/int/63/30.01.2014

Such an interpretation would suggest precedence of extrinsic motivation over intrinsic motivation. Ryan and Deci (2000) describe the coexistence of different types and levels of motivation in SDT, but that intrinsic motivation leads to better sustainability and learning.

As an open question, I asked whether they could suggest an alternative interpretation. My reading of the data was largely accepted, but then expanded to include that having a clear indication of time commitment brought the locus of control back to the individual, in terms of greater control over their diary.

In reality, non-study-related workplace issues could completely displace the intention of working on the OLR. This was particularly the case for the co-located subgroup members. One (P8) described how staff sickness meant that the clinical workload for the rest of the team increased, so this inactivated the DN subgroup

² Interview utterances are labelled: participant(s) code/source interview/line number/date

for a period. Locus of control may therefore be important to perception of time management.

...I had a member of staff off for about a month so our priority was treatment of the patients ...the website just took [a backseat]...

P8/SLPN4/226/04.03.2014

b) In relation to ways of working, I highlighted the lack of specific roles in subgroups; in particular, no clear leaders. I suggested this was because of an egalitarian norm within the SLPN. Used to dealing with each other as equals, it could be difficult to step forward as self-nominated leader and set task deadlines within the subgroup. One interviewee (P1) summarised the historic norm of not ascribing roles but just supporting and sharing:

R: they [subgroups] haven't ascribed roles...would that have made any difference?

P1: Yes, just from an organisational kind of thing you know. Maybe if ... you knew somebody was doing this bit, and you were doing that bit,... but it's always kind of been that way...I wasn't there at the inception of the group ...they were there just for support and to... share. I think over time as more ...strategic stuff has come in, there's maybe a bit of a change in how the group might work but...everybody, .. is still in the same mind-set

P1/int/108/12.02.2014.

When this was explored at SLPN4 there was some agreement that it was about the nature of the group (social norms), but there was also indication that it was related to a sense of having insufficient skills and knowledge.

First, the ways of working in relation to group norms were discussed. An exchange between P8 and P6 exemplified two approaches taken to roles and norms, and may suggest the relevance of theories of leadership to this study (NHS Leadership Academy 2013; Day 2014; Northouse 2016). The second utterance particularly highlights both social and practical dynamics of group working; both subgroups took a long time to start working productively.

P8: well we [DN subgroup] did...put someone in charge but that didn't really work out as planned, so you would have ... your leader of the group, it doesn't necessarily mean that it's going to make a difference.

P6: [LS subgroup] I suppose that's the advantage if you wait until you see how the group settles then you might get one person who naturally leads the group. Whereas if you just put yourself as lead it's quite difficult to know who's comfortable with [that], and who has, maybe that bit more time to do that.

SLPN4/280/04.03.2014

When specifically asked if an egalitarian norm meant it was hard to step forward as leader, P6 described that an appreciation of each other's workload inhibited the distribution of tasks and therefore it might have been easier if leadership had been allocated from outside the subgroup.

P6: ... because everyone's busy ...no-one wants to put anything onto anyone else either. So everyone is waiting for everyone else to get going.....I don't know if someone had been told, 'Right, can you just get that group organised' ...whether it would have been easier for us all too.

P6/SLPN4/246/04.03.2014

A long exchange between members of all three subgroups then followed concerning the difficulty in 'getting organised', which was suggestive of either needing more directive leadership from me, or of not knowing how to split the development of the OLR into manageable tasks. The exchange opened up an alternative explanation for the apparent lack of subgroup leadership; it may have been that the focus on the unfamiliar IT topic was a barrier to the transfer of previous project management skills. At the start of this project all but one of the participants stated they were complete novices in OLR design-and-build. In part, this novice status and the novel nature of the collaborative OLR development had motivated some to participate, as data in this, and later cycles, confirmed. However, the norm of the group was social interaction as co-experts, and the possible implications of a shift to novice status had not been fully considered.

It was only when, at SLPN4, I specifically asked whether more training would have been beneficial, that anyone overtly expressed a feeling of incompetence or lack of relevant technical knowledge. Participant P3 who, in the initial period, had asked for, and received extra technical training, openly described an initial phase of not sharing because of not knowing what to do.

P3: ...I also felt I was holding on to things before actually putting them on the website ...stuff which I didn't share, because [of] not knowing how to put it on.

R: so ... maybe having more technical training earlier on, that would have moved things on a bit quicker ...?

P3: yes I think so absolutely. For me it would have been helpful, yes

SLPN4/295/04.03.2014

Other participants then agreed. I later reflected that as an expert group these professionals were used to appearing competent in front of each other and the reluctance to ask for more help may have been linked to their new novice status. A psychological need for competency (self-efficacy) would concur with Self-Determination Theory of motivation (Ryan and Deci 2000), which was proposed as a possible explanatory theory from Cycle 2 (section 12.2.5), and therefore worthy of follow up.

My post-meeting critical reflection focussed on whether this indicated new key theories in relation to my role or that of other subgroup members. As the group had expressed expectations of my role as coordinator in Cycle 2, I had to consider whether this influenced the leadership style that was needed. This was reflected in my RD and reading shortly after SLPN4 and will be presented in Cycle 4.

An interesting finding in relation to learning and teaching was that neither the LS subgroup nor the other two subgroups (GP and DN) thought of the OLR pages as teaching in the same sense as their sessions of in-service HCP training. LS subgroup members described their part as sharing with equals rather than teaching:

P1: ...we're doing it for all of us, as equal people.

P6: I don't really think anybody would think of it as a teaching website, more a sharing and a..... place to put everything together so that there's one source for everybody.

SLPN4/318/04.03.2014

In contrast, members of the GP and DN subgroups described their OLR pages as information-giving initially, but then described concepts of layering and building on existing knowledge, typical of constructivist learning and teaching theories (Bruner 1966; Dewey 1963; Hardy, Jonen, Moller, et al, 2006). It may be that as experienced clinical teachers they had tacit knowledge of teaching and learning theories but, without formal teacher training, they lacked the academic vocabulary to make their approach explicit (Moseley, Baumfield, Elliot, et al 2005). Eraut (2004) wrote of the paradox that professionals articulate scientific knowledge, yet use it in a way that is largely tacit.

P8: ours is a quick information...

P3: ...guidelines for cellulitis, the contact list for the clinics, differential diagnosis, there's kind of a flow chart. I think mainly we thought, not so much how they learnt but how quickly they are able to find what they are looking for. GPs don't have lots of time and I'm hoping that ...maybe the next stage, behind the layer that we've made now, there will be ...

P8: well we've got some teaching because we've got a video for the district nurses...or would you say we 'demonstrate' to reinforce maybe what they've already been taught. But they get out of practice.... So they can go to the video and it should come back. So it's a teaching tool for that purpose.

SLPN4/324/04.03.2014

I then facilitated a discussion about the transferability of teaching skills, and techniques used in face-to-face teaching, to the online medium. Members identified in particular the use of visual information, mini case histories and discussion forums.

In terms of the analytical process, I concluded that distributing my interpretation of Cycle 3 data to SLPN members before SLPN4 gave an improved opportunity for the members to participate in analysis. Some issues arising were challenging to members, personally and professionally. To summarise, the dialectical analysis had clarified that:

- Greater external coordination would have been welcomed but only in that it brought the locus of control back to the participant in being able to organise their time.
- The egalitarian norm of the group may have influenced the lack of subgroup leadership, but an additional influence was the unfamiliar novice status; leadership theories might inform both the role of the researcher and subgroup roles.
- There was an apparent reluctance to relinquish public competency among the (normally) expert group, consistent with the self-efficacy construct of SDT.
- A facilitated discussion provided the potential for transfer of teaching skills to the online medium.

Greater awareness of each of these aspects allowed me to reflect further on my role as researcher and the implications of this for the facilitation of such a project in the future; in particular, whether leadership theory could inform this component of a model.

The dialectical method was still a new concept to the SLPN participants but the analytical process was improved by the sharing of my interpretation of data before the meeting. I acknowledged that not all members would have time, or perhaps the inclination, to consider my interpretations before attending. The discussion had widened the possible interpretation of data and, whilst I acknowledged that false consensus could occur from a dominant voice (Holian and Coghlan 2013), I felt happier with the sense of fit of my interpretation to that of the group, and having met the aim of virtuous conduct of AR (McNiff 2013b).

12.3.4.3 Findings in relation to facilitators and barriers

Facilitators and barriers were identified in relation to:

- motivation to participate,
- IT-related skills and knowledge,
- social group processes, and
- the AR process.

12.3.4.3.1 Motivation to participate

The perspective taken was that factors which affected ongoing motivation could be understood as facilitators or barriers to the process of LR development.

The individual interviews within Cycle 3 enabled exploration of what motivated people to participate, despite obvious time challenges, and why others chose not to be part of subgroups even when supportive of the study. Analysis of the interview data from Cycle 3 showed a number of reasons to participate (Table 12.3-1), which included anticipated feasibility and the perception of usefulness of the resource to self and others (value), to learn from the process and create a consensus on practice (self and practice development), to be involved in the group and to raise profile (social). Most interviewees expressed both intrinsic (e.g. learning) and extrinsic (e.g. service development) reasons for their level of participation.

Table 12.3-1 Motivating factors from first set of interviews

Date	Interviewee	Descriptors used for motivators
12.02.2014	P1, LS subgroup	<i>Do-able, workable, interesting to learn something new [technical and transferable knowledge], good resource for me as specialist.</i>
26.02.2014	P11, DN subgroup	<i>Great add-on to the teaching we do. Learn website building and clinical content.</i>
30.01.2014	P12, GP subgroup	<i>Great opportunity, privileged to be asked, nice to be included. Invaluable tool for others and ourselves. All involved in it, quality information we want. Once I buy in I won't give up on it.</i>
30.01.2014	P15, GP subgroup	<i>For us to support GPs, up to date information for us from other specialists, to raise our profile.</i>
02.12.2013	P16, non-subgroup	<i>The support of learner specialists/practitioners, and for existing specialists to exchange interesting cases. Flexibility to change in response to feedback if OLR poorly used. Interesting initiative that could enhance clinical reasoning. Help bring new people into 'the body of the kirk'[phrase meaning 'the community'].</i>
19.12.2013	P18, non-subgroup	<i>Too busy with other projects to be in a subgroup but good to be able to dip my toe in and be part of the process. Consensus view across Scotland on practice, save us all developing separate resources. Professional support. People more computer literate now [timely compared to past efforts].</i>

The expected value of the OLR emerged in previous cycles as a factor driving motivation (section 12.2). This was confirmed in Cycle 3 as OLR content developed, e.g. the educational videos. The actualisation of resources provoked an emotional response of achievement and worth (value) in a social context. The 'good feeling' was a potential intrinsic motivator to continue participating.

... when you open up the website ...seeing your information on there, that's quite a good feeling, to know that what you're doing is going to help others and help other patients... knowing that you're actually achieving something that's going to be worthwhile and helpful.

P11/int/48/26.02.2014

A potential barrier, as tacit influence on members, would have been a lack of support from SLPN founding members, but their support was evident. Founding member, P16, expressed backing based on the perceived usefulness of the OLR in directly supporting new LS (practitioners) and a perceived duty of experienced specialists to support new members.

I have for a long time thought that there needs to be some resource for [lymphoedema] practitioners who are in training and afterwards. Because ...having been a mentor for students... I'm very aware that the course is only the first part; and that we need to support peoples' on-going learning.

P16/int/7/02.12.2013

Further, P16 viewed the OLR as a potential means of drawing newly-qualified LS into the SLPN group to provide social learning. This approach would echo the situated learning of CoP (Lave and Wenger 1991).

...to bring them into the body of the kirk [community]. So that they ... get to know ... who some of the practitioners are. And that we are happy...to be able to support them in their learning and their development of their knowledge. Because otherwise I think it's a hard road to travel on your own.

P16/int/265/02.12.2013

Consideration of how much use would be made of the OLR, when developed, could enhance or reduce intrinsic motivation for some participants. P1 for example, echoed the anticipated sense of achievement of P11 above, but worried that others might not place the same value on the OLR and the effort would be wasted.

I hope that we'd have a sense of achievement of actually producing this...I'm hoping that people will actually use it...that's my only thing ... that we produce all the stuff for the specialists' bit, ... are they going to utilise it? ...I can see the value in it but ...if there's ...others who haven't been involved in it , they might not... potentially use it the way that we're hoping it to be used... I feel that we do need some feedback from others to see 'are we on the right track? What do you need?'

P1/int/123/12.02.2014

For P1 the involvement of non-subgroup LS as end-users, to give feedback to tailor the content, displayed an underlying assumption that a tailored OLR would lead to its greater subsequent use. Similarly, for P11, feedback was perceived as facilitating the tailoring of content and exposed blind spots and was therefore seen as an essential component of the process.

...well I've read through it today [the feedback from end-users] and it's actually been very helpful. You know, we might be blinkered because we know what we're talking about and we know what we want to say but you really need that feedback to get you on track from a community nurse or a users' point of view. You couldn't really do it otherwise.

P11/int/130/26.02.2014

This would be supported by the literature e.g. Carroll et al 2009.

A concern affecting motivation for P15 was regarding the liability of individuals, or of the group, in providing medical information online.

P15: ...the only ...concern I would have is that I don't know the kind of laws and legislations around ...what you put on the website and then who is ultimately responsible for that being posted. ...that you would get into trouble for something ... put on in good faith.

P15 and P12/int/218/30.01.2014

Echoing the finding of Archambault et al (2013), this matter had previously been addressed in Cycle 2 with information from JISC (see section 12.2). It highlighted the issue that participants who did not attend the SLPN meetings relied on a good cascade of information from regional attendees. The barrier in this case was therefore inadequate communication with non-attending subgroup members. I noted this as a point to follow up in individual interviews, in relation to communication possibly affecting sense of group belonging.

To summarise, identifying facilitators and barriers in relation to motivation were: achievement and sense of competence, local and wider social worth and accountability, and nurturing values which are common to CoP.

12.3.4.3.2 Skills and knowledge as facilitators and barriers

There was room in our OLR development process for participants to take different approaches to learning: receiving instruction, self-directed and peer-learning. I was interested in which would emerge, and what facilitators and barriers this exposed.

Participant P11 described both a social, collaborative process of learning and enjoying self-directed learning, but time for the latter had been a barrier.

P11: I think we just bounced off each other. You know when we're writing something, if someone's on the computer typing stuff and someone adds a wee bit...I think it's been a great learning curve, ... I think all of us here feel the same.

P11/int/72/26.02.2014

P11: I learn much easier if I have to work it out myself or ...[am] just given a few hints or a few basic clues and using that ... searching or experimenting. ... I've really enjoyed it and I would have liked to have spent more time on it.

P11/int/196/26.02.2014

Other participants, such as P12 and P15, had expected, and would have preferred, more structured training and supervision, feeling that insufficient training had been a barrier which had defined the nature of their contribution.

P12: we've given ideas and information but as for putting it onto the system... because we're probably not the most confident... for us inputting it, that would be a training skill on its own... I'd say that was my biggest barrier.

P15: ...definitely

P12 and P15/int/194/30.01.2014

This linked to the discussion the SLPN had at the end of the Cycle 2, when we discussed my role as researcher (and coordinator, section 12.2.4.1), and to frustration I recorded in field notes that people did not request help when stuck. A need of participants to maintain an appearance of competence was a possible explanation, as was a perceived lack of time to seek help. These were noted as ideas to explore further as the study progressed.

When discussed with the wider group at SLPN4 (March 2014), there was agreement that as many people as possible should learn the technical skills to ensure sustainability of the OLR. That is, as specialists retired or moved to different jobs, so the SLPN were left with someone who was able to maintain the website.

P5: ...then we'll never learn and we're still limited to the people who can maintain the website.

P1: I think it does need to be shared out because if it's going to be sustainable you need more people to do it all.

SLPN4/520/04.03.2014

As reported in subsequent cycles this did not translate into everyone taking responsibility to learn the skills.

For the LS subgroup, having to access training from an external source (KN) had resulted in a delay i.e. a practical barrier. For P1, this felt as though they had more to learn than other subgroups, starting their part of the OLR 'from scratch'.

P1: we've had to start that from scratch. I suppose it was a complete learning curve for us because we had to kind of get our heads round actually trying to work it and decide 'how do we want it to look'. So that sort of precluded everything first of all before we could even think about 'right what are we going to put on it?' So I think that's probably delayed us quite a bit really.

P1/int/70/12.02.2014

In practice there was a framework from which to build their OLR, as in the other subgroups, the difference being that training and support could not come from within the group, and that they had no control over the delay. This may again link to the external rather than internal locus of control (see section 12.3.4.2).

After the initial learning, retention of skills was a problem for some due to lack of continuity, fitting OLR development piecemeal around regular clinical work. This was described in interview by P11.

P11: ...because we've had gaps between each session, it's just refreshing ourselves to the process of adding information on. ...we've struggled to retain that skill... if we'd done it all at once, we wouldn't have had that problem.

P11/int/57/26.02.2014

By SLPN4 the DN group had reflected on this problem, recognised the ineffective use of time, and planned to change their way of working. Where time had been a barrier to effective learning, the cyclical, reflective process of AR became a facilitating factor in resolving the issue.

P8: We find we had too long a break then we've forgotten what we've done and it's taken us more time to look back, and so for our next quarter were going to try....

SLPN4/441/04.03.2014

Finally, the process of articulating the specialists' knowledge on the OLR was an additional source of learning, expressed particularly by the DN subgroup, individually and as a group.

P11: You know it took us some time to get something down on paper, or on the website, that covered that. It's an instinctive thing ... as is most of our treatment really or our practice... Like a higher level of thinking really isn't it?

P11/int/176/26.02.2014

In the process of agreeing the wording of tacit expert knowledge to make practice explicit to non-specialists, differences in practices were exposed where there had been assumptions of commonality or shared repertoire, as suggested by Wenger (1998). In this way subgroup members learnt from each other in critical reflection on practice, further developing their knowledge. Where the difficulty expressing tacit knowledge might have been a barrier, the collaborative process facilitated learning and OLR development.

To summarise, identifying facilitators and barriers in relation to skills and knowledge showed that the process allowed for different approaches to learning but that, in response to a sense of incompetence specific to IT, some people wanted more structured training and coordination than was given. In addition, despite group agreement that sustainability on the OLR would rely on multiple members having the skills and knowledge, there seemed to be a reluctance to request help; explanation of this reluctance would require further supporting data. In practical terms, one subgroup's reliance on external training was a barrier that was beyond their control, but the cyclical reflective process had helped overcome other barriers (time management and articulating tacit knowledge) and had created greater learning.

12.3.4.3.3 Social group processes and the facilitators and barriers within.

Analysis of social processes within the group highlighted facilitators and barriers. Thus, lack of trust was a barrier to progress on the LS part of the OLR, which resulted in defining the criteria for membership; the collaborative process for legitimisation of content and agreement on the projected profile of the group (identity) was a facilitating factor.

Membership and trust: LS subgroup participant, P6, had the task of steward (Wenger, White and Smith 2009), administering the password for the section of OLR intended for SLPN members only. Membership of the SLPN had historically

been voluntary and a tacit understanding of the criteria for membership had developed. Whilst criteria of those who could attend the meetings were defined in the constitution, the remaining non-attending membership criteria were not defined. P6 expressed her dilemma in supporting newly-trained LS (practitioners) when some content was intended for sharing only with some types of HCP.

P6: ... how are we allowing access to someone who is just started [as a] practitioner, and doesn't come to SLPN... How do we decide who gets access to this password-protected area? Because obviously it's more than just us that we want to have the use of the resources...or do we?

SLPN4/815/04.03.2014

This participant goes on to describe her concern regarding control of the use of teaching resources.

P6: ... you've got to be careful because if we're putting on things like our teaching resources, which I think definitely would be a good idea, you also want to know who is actually using it ...how are they getting used? ...that's quite a big leap of faith ... if you've got a good presentation with your patients photos on it you don't actually know how it's being used or where it's being used ... It becomes quite a different sort of thing to post in stuff. But I'm not quite sure how we control that.

SLPN4/836/04.03.2014

The group discussed the issue at length. Some members were satisfied that individual professional accountability would prevent inappropriate use of materials whereas others were not convinced. The matter was not entirely resolved. The group agreed to a vetting process for access to the LS section through a short application form. This decision made explicit a change of classification of the group, to a restricted membership or closed group. Defining the group as one of closed online membership could have implications on the future learning within the password-protected area, in that the breadth of input and challenge may be limited. In relation to open and closed groups, Dubé et al (2006) concluded from a review of the literature on VCoPs, that an advantage of open groups was that even those members who do not explicitly contribute can

learn by lurking. Further that whilst closed groups might be easier to manage, the lack of cultural heterogeneity could lead to group think and stagnation of ideas.

By this stage of OLR development, SLPN members could see the online materials for GPs and nurses and talked of the OLR as their identity to an external audience. In a suggestion which showed a sense of taking ownership and responsibility for the OLR, members P8 and P2 suggested the SLPN review the content together, before launch and on an ongoing basis.

P8: as a group would it be an idea, once we've developed the website [OLR] then to spend one afternoon going through the whole website as a group...

P2: In the longer term if things are going to be reviewed and it's always going to be on the agenda maybe one site of the website could be the subject of the review in turn at each meeting? So it's a rolling programme.

SLPN4/955/04.03.2014

It had emerged during the interviews of P12 and P15, P11, and P18 earlier in Cycle 3 that it was thought important to produce a national consensus through development of OLR content. Therefore the decision at the end of Cycle 3 to review the content 'as a group' was consistent with individual interview data. The process of within-subgroup, then inter-subgroup and external end-user review was therefore extended to include a final stage of whole group review. The social group process of democratic agreement as the norm for the SLPN group therefore enabled a consensus view to be formed on the OLR. This relates well to Wenger's (1998) description of the work of a CoP being the reification of the knowledge of the group and that identity was intimately tied in with the process. Similarly the need for group approval would relate well to the construct of relatedness identified in Self-Determination Theory (Ryan and Deci 2000).

In conclusion, the social processes of the group enabled a consensus view of OLR content, but a lack of clarity on criteria of membership meant that trust remained a barrier to the sharing of teaching resources in the LS community section.

12.3.4.3.4 Facilitators and barriers in the AR process

The findings in relation to facilitators and barriers emerging from the AR process were initially identified from analysis of interview data, field notes and the RD. These then informed the collective review of the programme manual (Appendix 19). Included were facilitators/barriers in how the research process was conducted and communicated, and the practical influence of technological and organisational limitations.

Variety of feedback: A significant facilitator in the process of OLR development was the inclusion of different types of feedback to inform progress. Despite a delay in securing the feedback from two GP end-users at the end of Cycle 3, the feedback received was positive and constructive, enabling tailored changes and motivating participants (e.g. Appendix 23). The combined feedback from peers and end-users may have had a legitimising effect for participants, similar to that described in relation to CoP (Lave and Wenger 1991; Cox 2005).

We...do need feedback from ...the wider others, to ... get a sense of 'are we on the right track with things?' ...'what about ...more experienced specialists, what do they ...need?' ...it might be a bit different than ...some of the newer qualified specialists...

P1/int/14/12.02.2014

Reluctance to ask for help: A barrier, for some, identified in Cycle 2, was the fear of 'spoiling' the research by asking for help (section 12.2.4.1) and this was addressed at the time as a lack of understanding of the research process. However, an alternative explanation suggested in Cycle 3 was the psychological need for competence, which might have made asking for help difficult. Additional data were needed to explore this further.

Inadequate communication: These early individual interviews identified that the information cascade structure in some subgroups may have created additional barriers. Where some subgroup participants had been invited to participate by core members rather than myself, there was, at times, a lack of clarity of expectations and procedure.

P12: ...we were quite clear at the start but lost our way a wee bit with it to be honest... we thought we had a few meetings organised with XXXXX [P3] ... but it ...was kind of 'work on your own'.

P12 and P15/int/21/30.01.2014

All participants had received written participant information, but with the iterative nature of AR, and my expectation that subgroups would organise their own work, communication was insufficient for these interviewees. Interviews in subsequent cycles would inform further regarding this potential process barrier and whether an overt coordinating role was needed from either the researcher or other party.

As identified in Cycle 2 (section 12.2), the formation of one subgroup mostly from a co-located team created a different type of communication barrier, affecting coordination: a lack of e-mail communication inadvertently excluded me (as the researcher) and a remote member (P9).

Regional rules and restrictions: Additional barriers emerged from variable restriction of NHS health boards on the use of different types of software. This affected the way the subgroups worked and reduced the potential for virtual co-creation of materials. For example, the LS subgroup members found that only three of them could administrate their OLR pages, forcing the fourth member to contribute by proxy. At the evaluation of Cycle 3 (SLPN4), a non-subgroup member empathised, making explicit the barriers, which were confirmed by two participants from the DN and GP subgroups (P3 and P8 respectively).

P26: It's almost easier doing it from home really because you can use your own Wi-Fi and do Facetime or something on your iPad whereas when you're at work you don't have that access, it's harder.

P3: You can't use Skype and things...

P8: We're not allowed.

SLPN4/698/04.03.2014

In summary, the way the study was conducted gave rise to some facilitators and some barriers. Notwithstanding practical delays in getting end-user response from some participants, the multiple sources of feedback were enabling. Possible barriers to participants requesting help were suggested, but more data were

needed to substantiate or challenge potential explanations. Similarly, further data were needed in relation to the cascading of information to subgroup members and whether or not the researcher needed to take a stronger coordinating role in this respect. Further interviews of members of the co-located subgroup would help illuminate in what respect co-location had been a barrier or an facilitator. Finally, a practical barrier to virtual working, within subgroups, was regionalised restrictions on the use of software for collaborative working. The findings in relation to barriers at this stage would support the findings of Archambault et al (2013) but the data from further cycles may inform this view further.

12.3.4.4 **Learning from collective review of the Programme Manual**

Cycle 3 included a collective review of the programme manual, that is, the anticipated plan of action compared to the reality. There were very few changes, which are listed below.

- a) Greater number of participants in each subgroup, fewer subgroups
- b) Technical support was ad hoc and tapering, rather than at pre-defined intervals
- c) Input of education theory was barely noticed until prompted with examples
- d) Activity or reflective logs were kept by very few
- e) Two subgroups had experienced delays: the GP subgroup in getting end-user feedback and the LS subgroup in receiving training.
- f) The disagreement resolution process had not been tested
- g) In relation to sustainability, all subgroups wanted to continue for a period beyond the study before handing over responsibility to others.

a) SLPN members wishing to participate in subgroups had a preference for development of the GP and the DN (community nurses) pages of the OLR, and in creating a community space for their own resources. For this reason the pages for AHPs were postponed. A possible influencing factor on numbers within subgroups at the outset was a lack of technological skills and knowledge, that is, seeking

comfort in numbers, or as alluded to in Cycle 2, reducing the cognitive load, but this was not explicitly confirmed in the data. Having worked in groups of four or five, the subgroup members reflected that it was ‘a good number’. Wheelan (2009) studied productivity in groups and found groups of between 3 and 6 to be more productive. However, the relationship between group size and individual learning is more complex (Tomcho and Foels 2012), with Bailey, Barber and Ferguson (2015) suggesting that it may have more to do with the involvement of the ‘instructor’.

b) We had anticipated in the initial programme that subgroups would need regular technical support and approximated fortnightly intervals. In practice, participants recalled that support was more frequent at the start then tapered off as confidence grew.

c) We had expected that as the study developed I might have had a role in bringing in education theory as the participants’ ideas became clearer on the type of learning resource they wanted to develop. The initial response when asked if this had been useful was that they had not noticed it. However, the input was recognised when examples were given e.g. layering, interactive resources, and terms such as shapers and lurkers. I later reflected that this was possibly an outcome of a conscious decision not to overtly use academic terms which might have increased perceived complexity. Most of the SLPN members had teaching experience but no formal teacher-training. In addition, presenting such theory in great detail would have positioned me as an outside academic rather than an insider, and had practical implications regarding the time taken within meetings. A counter-argument was that my input was an opportunity for SLPN members to learn about education theories. I had given brief descriptions, with offers of more information if desired. I concluded that applications of education theory in practical decisions were likely to have been from a tacit identification with participants’ personal learning experiences, regardless of a lack of labelling from me.

d) The keeping of a reflective diary specific to the study was only reported by participant P1, who said it had been useful for interview preparation but had not influenced the OLR development. A meeting log had only been kept by the DN subgroup. Participants felt ‘Subgroup feedback sheets’ were sufficient to capture

decision changes. Nevertheless, in subsequent interviews participants were able to reflect on the different learning gained, which will be reported in Cycles 4 and 5.

e) Some slippage in the study timeline had occurred for two subgroups. Thus, where we had anticipated that by SLPN4 (March 2014) all three subgroups would have had time to respond to end-user feedback, this was only true for the DN group. The delay in training for the LS group meant that their section of OLR was not ready for testing. Meanwhile the GP subgroup had identified their GP end-users but delays in availability led to their interviews being held shortly after SLPN4.

f) The procedure agreed for dispute resolution had not been invoked. Interestingly, participants felt this was because of the stage of the study, not because of non-confrontational norms.

P8: I would say that initially, and now, we're only just trying to develop it; we haven't really had time to look at it all.

R: ...and so you're thinking that [confrontation] might be something that will come?

P8: It could do at the end.

P1: Later... [when we try] to make it all kind of look the same perhaps.

SLPN4/103/04.03.2014

g) In the initial programme manual we had not been specific about the plans for sustainability, allowing these to develop iteratively. As all subgroups had reported that OLR development was taking more time than anticipated I was surprised that all participants suggested keeping the same subgroup structure beyond the length of the study to November 2014. The agreement was that one person from each subgroup would then provide training for new administrators.

12.3.4.5 Summary of evaluation of Cycle 3

Our evaluation of Cycle 3 concluded that the OLR development process was progressing broadly as per the initial manual but the iterative evolving style had enabled small process changes that allowed us to overcome some psychological

and practical barriers. However, where the locus of control was outside of the group such flexibility was not possible and had led to some delays in training and end-user feedback.

During Cycle 3 we specifically focussed on the facilitators and barriers to the collaborative development of the OLR. We judged a benefit from the circulation of my interpretation of the data before SLPN4. During the meeting some interpretations were further developed and some were challenged, at least to some extent.

12.3.5 Specifying the learning: discussion of Cycle 3.

In Cycle 2, progress had been perceived as slow and, although the main reported barrier was limited time, there was some indication that other things, including motivation, skills and knowledge, the group working and the role of the researcher were influencing factors. For each of these, possible explanatory theories were mooted, subject to further data. In this third cycle, the lens of facilitators and barriers was used to gain a better understanding of each of these, whilst remaining open to other key components of the OLR development process. In general terms, the barriers identified were consistent with findings of Archambault et al (2013). However, rather than merely listing the barriers, we were interested in the possible explanations underpinning those barriers.

Consistent with the findings of the previous cycles, participants described motivation from anticipated and then actual sense of achievement, and the worth of the OLR as a resource and as a means of drawing new members into the community and supporting their learning. This would appear to confirm Self-Determination Theory (Ryan and Deci 2000) as an explanatory theory of motivation in the context of this study, in that an underlying psychological need for autonomy, competency and relatedness can be identified. Some specific findings are worthy of further consideration.

In relation to autonomy, the participants described a wish for greater external coordination of activities, explaining that this was in order to manage their time

better. Initially this was considered in terms of an external and internal locus of control. Deci and Ryan (2000) argue that to relate autonomy only to locus of control is too simplistic and that autonomy is the desire to organise one's experiences and activity to be concordant with one's sense of self. In this respect I felt that further data would be needed to be certain that Deci and Ryan's construct was relevant.

The absence of requests for help could be interpreted as a lack of awareness of need i.e. unjustified confidence, but no SLPN participant had expressed confidence. The absence of requests was therefore interpreted as a reluctance to ask for help. Differences between the use of the terms confidence and competence in HCP self-evaluation have been discussed elsewhere (Stewart, O'Halloran, Barton et al 2000); in this study our use of the term competence followed on from Phase 1 focus group discussions and was pragmatically interpreted as self-efficacy or a 'sense of feeling able'. A reluctance to ask for help therefore may be because participants wished to appear competent in front of peers and so delay a request for help; however the quickest way to achieve competency would be to ask for help. Deci and Ryan (2000) describe that the way a person responds will depend on their causality orientation and regulatory style. That is, despite a basic need for competence, the sum of life experiences will adapt behaviour giving a different response to the same basic need. On this basis it is possible that both behaviours - asking or not asking for help when aware of need, are consistent with SDT. However, alternative explanations including a perceived lack of time to seek help and a lack of clarity on the research process were also suggested. The strength of these possible explanations were explored in subsequent cycles.

A basic need for relatedness to others, or sense of belonging, was interpreted throughout the data from Cycle 3. This was shown in the desire to create a specific national profile on the OLR, and that feedback from the whole SLPN membership was just as important to them as inter-subgroup and end-user feedback. The desire to draw new practitioners into the group may similarly be connected to the need for a sense of identity. Paradoxically, the concern regarding teaching materials being shared with new members also reflects relatedness, in that there are insiders and outsiders of the identity. This issue also reflects the literature on CoP, in that there is a danger that the SLPN could

become too insular and exclusive for new learning to occur (Wenger et al 2002; Roberts 2006). On a wider social scale the desire to respond to HCP educational need and improve patient management would arguably represent a wider sense of relatedness. There were too few interviews in Cycle 3 alone to be able to compare responses to the sense of belonging between, for example, those who attended the meetings and those who did not. Data from subsequent cycles would further inform the explanatory strength of both SDT and CoP theory for relatedness.

In relation to skills and knowledge, different types of learning approaches were present. The intention of drawing new members into the group and supporting their learning would fit with the concept of situated learning described with apprentices in a CoP (Lave and Wenger 1991). However, in the present study the participants were non-hierarchical existing members; none were apprentices in the clinical speciality, but almost all were new to OLR development. In a study of collaborative knowledge creation in CoPs, Jakubik (2008) described a collaborative learning approach where learning, knowledge and the social context of the CoP were considered as three domains which are inextricably intertwined. Despite basing the approach on the situated learning of Lave and Wenger (1991), Jakubik describes knowledge as emerging through discussion and active dialogue to achieve shared understanding, a description more akin to socio-constructive learning theory (Vygotsky 1978). Jakubik (*ibid*) assumes a personal construction of knowledge where the social context is pivotal. The micro-behaviour of this peer-to-peer learning includes “dialogues, commenting, discussing, sharing, and reconceptualising” (Jakubik 2008, p9); a key goal being the enhancement of critical thinking, thereby enhancing learning from questioning assumptions and solutions. Whilst this behaviour was not evident in the first two cycles of this study, my explicit request for consideration of alternative explanations for dialectic analysis in this third cycle facilitated more critical discussions of data interpretation. However, in conflict to the collaborative learning approach, not all interviewees in this study had taken responsibility for their learning. Of the subgroup members interviewed in this cycle, two had undertaken individual, experimental, self-directed learning, whilst two had assumed there would be further training and regular in-person support. Only one of the four subgroup interviewees was a core member, therefore this was not simply a matter of

difference between core (meeting attendee) and outer (non-attending) members. Whilst it is possible that an innate level of confidence with technology could have affected their learning approach, it may have also been influenced by differences in the communication of the research process.

In describing workplace learning, Eraut (2004, 2010) indicated that managers (as leaders) have a key role to play in learning. Although not situated in the clinical workplace, participants spoke of me as the project-leader on this work-based enterprise. Based on the norm of my peers as equals, I had assumed participants would request support or training as needed, assuming a hands-off leadership style. With the realisation at SLPN4 that this was only occurring in a few cases, it prompted consideration of the style of leadership that had been required. I considered my existing understanding of the traditional continuum of leadership styles from dominant autocratic, through democratic to the delegative (hands-off) style based on the work of contingency leadership theorists Tannenbaum and Schmidt (1958).

I was observing to them that there was no clear leadership in the subgroups and I was asking if this was because they thought of themselves as equals, but I realised on reflection that ironically I was doing the same. Leadership theory (Bass and Bass 2008) says that a Delegative (Laissez-faire) leadership style works well in expert groups where they are used to being autonomous, goal setting etc. So I was trying to encourage the group to make all the decisions. Also because I thought there would be problems with ownership and sustainability if they thought of it as my project rather than theirs. But the same theory points out that this style does not work with novices. I was thinking of them as experts in clinical knowledge and teaching it, but not allowing for the situation that their focus was on the process of website building, at which everyone was a novice. So in fact a more autocratic style ... would have been better, at least at the start. Finding a balance between autocratic and democratic would still have allowed for more learning than a purely dominant leadership style but with novices would have been quicker and more effective than expecting responsibilities to have been delegated right from the start.

The implication of accepting the relationship between leadership style and the novice-expert status as explanation for the slow start was that in the current mid-stage of the study, some participants would have already gained some competence, moved on and be happy with taking on responsibility for their actions and learning, but others would need more directive leadership and support (Bass and Bass 2008). This approach would be consistent with the concept of scaffolding learners in constructivist learning theories (Bruner 1966; Wood, Bruner, Ross 1976). The implication for the model of OLR development was that the style or role of the leader/coordinator would change as the competency of the participants increased. The degree to which someone could move away from a preferred leadership style would need to be considered (Zigarmi, Edeburn, Blanchard 1997). I reflected that making my tacit understanding of leadership explicit through reference to leadership theory might inform the study.

A facilitated discussion gave potential for transfer of teaching skills to the online medium. This may have provided the scaffolding described above, however it could also be interpreted as facilitating use of familiar schema as described by Sweller (1988) and van Merriënboer and Sweller (2010) in CLT(section 12.2.5.2). Further interviews were anticipated in Cycles 4 and 5 which would allow further exploration of the participants' perception of their learning. The extent to which learning theory should inform leadership style was worthy of further consideration.

The mid-study review of the programme manual had not identified many changes to the process of OLR development. The initial programme manual had been loosely based on systems development lifecycles used in software engineering, which fitted well with the cyclical process of AR. These are variously described as spiral, iterative, incremental and evolutionary prototyping (Floyd 1984), each with slight differences in their processes. The basic idea carried into our study was that developed materials would go through ever-widening circles of reviewers so that there was time for responsive changes and for confidence to build. This too fits with the concept of scaffolding learning. Further, a staged launch allows for testing of technical capabilities. We did not decide on the nature of the final launch of the OLR, i.e. level of publicity, until Cycles 4 and 5.

12.3.5.1 Summary of findings and questions emerging from Cycle 3

Using the lens of facilitators and barriers proved useful in analysing the process of OLR development. In particular, it identified that there were facilitators and barriers within each of the themes of motivation, social group processes, skills and knowledge, and the process of research itself, including the role of the researcher, which seemed to affect both the development of the OLR and the learning gained by participants. Possible explanatory theories included:

- Self-Determination Theory of motivation (Ryan and Deci 2000),
- Community of Practice and Situated Learning (Lave and Wenger 1991),
- Constructivist and socio-constructivist learning (Brunner 1966; Vygotsky 1978)
- Cognitive Load Theory (Sweller 1988)

The above theories were provisionally supported by the data of this third cycle and areas were identified where further data could strengthen or challenge the proposed explanatory theories. In addition, further data could show whether or not leadership theory could inform the study; and allow elaboration both of the understanding of the learning, and the possible influence of leadership on the learning, and vice versa. Further data were required for a greater understanding of whether these themes equated to key components of a model of the OLR development process and, if so, how such components related to each other.

12.3.6 Questions to address in next cycle

The main question to address in the next cycle became:

What are the key components of a model for producing an OLR and how do they relate to each other?

A sub-question to address was:

How might literature on leadership theory inform the study, retrograde in terms of understanding the role of the researcher in the first three cycles, and prospectively into the AR cycles?

12.4 Cycle 4 March 2014 – June 2014

12.4.1 Question driving this cycle

What are the key components of a model for producing an OLR and how do they relate to each other?

The previous cycles of this study supported SDT (Ryan and Deci 2000) as a possible explanatory theory of motivation and CoP (Lave and Wenger 1991; Wenger 1998) as a conceptual framework of the social group; component constructs were therefore considered interim key components of the model of OLR development. In addition, a number of learning theories had been invoked, and of interest was a possible link between these and the researcher's role in terms of leadership style. Reflexively, I recognised that my thinking on the style of leadership was based largely on tacit knowledge, therefore an enhanced understanding might be developed from relating contemporary literature on leadership to the findings in the first three cycles to thereby inform the conduct of the remaining cycles. Therefore, a sub-question of this cycle was:

How might literature on leadership theory inform the study, retrograde in terms of understanding the role of the researcher in the first three cycles, and prospectively into the AR cycles?

12.4.2 Planning process

The plans for Cycle 4 were formed and agreed at the end of SLPN4 (March 2014). In response to the evaluation of the programme manual the overall practical processes would continue. This would be a relatively short cycle of 3 months.

Action plans: Two remaining GPs (P24, P25) and two LS (as end-users P3, P9) were to be interviewed to complete the first round of feedback (Table 11.4-1). Having received feedback from end-users, and from the members at the SLPN meeting, the plan within subgroups was to agree responsive changes to the OLR, implement the changes, then identify further end-users for a second round of end-user testing.

Specifically:

The LS subgroup members had a clearer idea of their OLR pages being populated by the community, so planned to build a framework with exemplars in each section. In order to establish the password-protected element of their pages they needed explicit criteria for SLPN membership. Since defining membership affected the constitution of the group they would propose wording to be circulated before a formal vote for agreement from the SLPN membership.

The GP subgroup members planned to continue working virtually. They would receive their first round of end-user feedback within the first few weeks of Cycle 4. Their plan, based on constructivist and information-seeking theory, was to develop deeper educational layers to their pages, but only if the feedback indicated this was needed.

The DN subgroup members planned to reorganise how time was set aside for the study for greater carry-over of learning between sessions. In response to concern that the OLR content should be relevant to HCP across Scotland, urban or rural, they planned to use nurses from outside their health board for the next round of end-user feedback.

Researcher as coordinator - as agreed from evaluation of the previous cycles, I would give participants more specific guidance on timing, so that work could be coordinated across subgroups and within the requirements of the academic study. That is, what was expected by when, not how it should be achieved.

Researcher as subgroups' participant I would add a visitor count tool to the OLR, as the group decided this would give some sense of the value of the OLR and motivate future sustainability. Also, I would create an e-mail address specific to the OLR so that users could interact with the SLPN and long-term feedback on the OLR would be encouraged.

All SLPN members planned to review collectively the OLR in its entirety, at the end of Cycle 4 (June 2014).

Research plans: Five interviews of subgroup participants were planned; two each from the DN and LS subgroups, and one from the GP subgroup (since a pair had been interviewed together in Cycle 2). The template for semi-structured

interviews of subgroup members was changed to explore the participants' experience, and the emergent themes of motivation, learning, group construct and time, whilst still allowing flexibility for new issues to arise (Appendix 16, v2). The questions within the template were indicative prompts, and not intended to be used verbatim.

In addition, it was agreed that I would review the findings of the first three cycles in relation to the literature regarding leadership and consider the implication on my role and for the model of the process of OLR development. My interpretations would be discussed with critical friends, as is characteristic of the AR method (see section 10.2.1), before sharing with participants to inform the study.

12.4.3 Actions taken in OLR development

A number of actions in this fourth cycle were in response to Cycle 3. For example, in response to requests for further technical training, but lack of opportunity for meeting up, I created a short film on how to upload content onto the OLR and e-mailed it to subgroup participants.

Looking through related literature I was able to identify, for the LS group, theoretical support for the design of their OLR pages as an online community (Wenger et al 2002). In addition, further to the discussions about the criteria for SLPN membership, I discussed with the LS subgroup a typology of online CoP (Hara et al 2009) which emphasised the importance of first understanding the group, members' expectations and purpose of the online space. The LS subgroup responded by creating an online questionnaire with Survey Monkey[®] to establish the views of the SLPN membership. The LS subgroup concluded that the extra security offered by housing the LS part of the OLR within KN satisfied members and that it was viewed as a form of organisational knowledge management. That is, it was viewed as a resource for current and future members and, reflecting an earlier interview with outer member P16, it would capture knowledge that might be lost as experienced people leave the profession. This view of knowledge as an asset was consistent with the contemporary political context of health in Scotland, of asset-based management (section 1.2).

The LS group received formal end-user feedback from two LS (P3, P9) and direct informal feedback from others, and had a face-to-face meeting to make responsive changes, which I attended (29.05.2014). The main requirement by the end of Cycle 4 was to get more SLPN members to register and participate in populating the LS pages.

The DN subgroup members focussed on making the changes suggested by end-users in Cycle 3. By the end of Cycle 4 they requested that the wider SLPN membership view their pages, and were considering ways of identifying community nurses from outside their health board to give feedback, indicating growing confidence.

The GP subgroup received positive feedback from two GPs (P24, P25) about the utility of the design and content of the GP pages of the OLR. Specific suggestions were made by the GPs regarding additional content and how a link to the OLR might be circulated when ready. The changes were made through virtual meetings over the period, so that by the end of Cycle 4 the subgroup was ready to identify further GP end-users for feedback.

12.4.4 Data collection, analysis and evaluation of action

The first part of this subsection describes how the findings of the first three cycles were considered reflexively in relation to leadership literature. It is reported here rather than at the end of 13.3 since it was an action agreed at the end of Cycle 3 as part of the plans for this cycle. Chronologically therefore it occurred at the start of Cycle 4 and may have influenced the collection and interpretation of the data. As implied in Chapter 10, the end of one cycle and beginning of the next is not always as distinct as academic reporting would suggest.

12.4.4.1 Relating the interim findings to leadership literature.

The way I conducted the role of researcher-as-leader in the first three cycles was influenced by my pre-study knowledge base which was experiential and based on formal education in *management* rather than *leadership* per se. The first consideration was therefore whether or not there is evidence in the literature of a

difference, a subject of perennial and sometimes sterile debate according to Edmonstone (2015). Much of the literature on management and leadership is written by experienced business leaders and is anecdotal, based on decades of experience of what works in practice rather than formal research. One of the most cited authors is J.P. Kotter, particularly in relation to leading change (e.g. Kotter 1996). He has argued that the functions of management and leadership are quite different but could be complementary. Management was described as maintaining order and consistency whereas leadership was about producing change and innovation (Kotter 1990). Rost (1991) similarly discerned differing functions, where managers coordinated group action from ascribed unidirectional authority, whereas leaders worked *with* group members developing mutual purpose. These were in contrast to previous literature: Zaleznik (1977) for example suggested that the roles were so different that they should be different people, arguing that managers were reactive and closed options down, whereas leaders opened up options and were more emotionally involved. However, a recent study by Simonet and Tett (2012) examined the overlap and differences between leadership and management competencies. Starting from a justified taxonomy of competencies based on a review of literature, 43 experts identified that over a third (22/63) of competencies which could be described as managerial or leadership were overlapping. Further, that many other competencies were ‘non-designated’, that is, were not clearly one or the other. Based on their findings the authors concluded that many of the early leadership theories could also have been described as management theories. The label on my formal training may therefore be immaterial. Of interest however was how the descriptors of the researcher role used by the participants in SLPN3 (Nov 2013) and in Cycle 3 interviews, would map to the unique descriptors found in the Simonet and Tett (2012) study. Unique descriptors for leadership were: motivating intrinsically, creative thinking, strategic planning, tolerance of ambiguity, and people-reading. Unique descriptors for management were: rule-orientation, short-term planning, motivating extrinsically, orderliness, safety concern, and timeliness. At SLPN3 participants had contested the suggested controller description, opting instead for facilitator, and identified with advisor and guide rather than driver, suggestive of people skills and motivating intrinsically (leadership) but also described good and timely technical support (management)(section 12.2.4). By SLPN4 however there was a need expressed for

greater coordination (section 12.3.4.2) which might suggest that taking more of a managerial role would have benefitted participants.

Based on the premise that the function of an AR study was to bring about change, a framework based on Kotter's 8 steps of Leading Change (Kotter 1996) implicitly guided the first cycles of this study. A template of the 8 steps in relation to this study was designed (Appendix 24) and was a useful construct at the start of Phase 2 for getting engagement and ownership (in Kotter's terms - 'buy-in') of SLPN members. A recent review of literature covering 15 years following publication of Kotter's framework found that there was empirical evidence to support only some of the eight steps described, but concluded that it remained influential and recommended further research on the structure as a whole (Appelbaum, Habashy, Malo, Shafiq 2012). On the whole Change Management was superseded in the literature by the concept of Transformational Leadership (Lowe and Gardner 2001; Bass and Riggio 2006; Anderson and Anderson 2010) and a growing interest in Adaptive Leadership (Heifetz 1994; Heifetz et al 2009; Thygeson, Morrisey, Ulstad 2010).

Based on my experiences preceding this study I had envisaged leadership style as a continuum from autocratic through democratic to delegative. Relating this to the SLPN norm where, as peers, we considered each other as competent in most aspects, a delegative (or low directive) approach was appropriate. From the findings however it became clear that with the participants' focus on technology, they did not feel competent, and I therefore wondered if a more directive approach may have been more effective. This conceptualisation was based on the Situational Leadership model (SLII[®]) (Blanchard 1985; Blanchard, Zigarmi, Nelson 1993). As the name implies, leadership is expected to vary with the situation, dependent upon the competence and commitment of the followers (participants) and the complexity of the task. The descriptors used being *directing*, *coaching*, *supporting* and *delegating* where directive and supportive behaviours are separate variables.

- S1 - directing - high directive, low supportive behaviour
- S2 - coaching - high directive, high supporting
- S3 - supporting - high supportive, low directive

- S4 - delegating - low supportive, low directive

An additional dimension is the development of the followers, which is on a continuum from low to high. Development is comprised of two follower variables, commitment (itself comprised of motivation and confidence) and competence, each of which may be high or low. The approach, though claimed to be widely used and proven in the workplace (Northouse 2016), is poorly underpinned by theory, with vague constructs, e.g. what constitutes high or low support, or low follower confidence (Thompson and Vecchio 2009). There is limited research into the concept specifically in nursing (Lynch, McCormack, McCance 2011). SLII® is intuitively practical but how its model relates from leading individuals to leading a group is unclear, despite the adaptations made in response to group-development theory, which created the second version of situational leadership i.e. SLII® (Blanchard and Hersey 1996). There seems no accounting for demographic differences e.g. sex or age differences, Blanchard et al (1993) arguing that research had shown that demographic differences made little difference except perhaps gender. In tests of three versions of SL, Thompson and Vecchio (2009) concluded that despite reservations regarding the SLII® as it stood, the basic principle of giving more support to new/inexperienced people and more autonomy to the experienced was supported, although arguably not unique to SL. In addition, confirming the views of Blanchard et al (1993), Thompson and Vecchio 2009 found that what mattered was the followers perception of the leader's style, not the leader's intentions.

In relation to this study, in Cycle 3 interviews and discussion at SLPN3 (Nov 2013) regarding the researcher role, it became clear that the participants perceived my role to be a facilitator and guide, which would imply S3 in the SLII® model. As previously described, I had intended a non-directive style of leadership in order not to alienate participants and to achieve an egalitarian ownership of the OLR. However, the findings suggested that this had not been the right approach for the level of competence at the start of the study but would become increasingly appropriate as participants gained competence. The reflection to make explicit my understanding of the leadership continuum, in particular, the SLII® model therefore had proved useful but was limited to, somewhat predictably, concluding that those who had already gained competence and confidence would require less

support and direction, whereas those who had not might benefit from a more directive and supportive approach in the next cycles.

More recent concepts of leadership were then considered to see if they would have greater explanatory power for the study. Bryman (1992) described a New Leadership paradigm which gives more attention to affective dimensions of leadership. Transformative Leadership (TL) is one such approach (Burns 1978; Bass 1985). A transformational leader, Bass argues, motivates followers to work for the greater good transcending individual self-interest, achieving much more than would have been expected through transactional leadership (Bass 1985). Indeed Avolio described the approach as fundamentally morally-uplifting (Avolio 1999). TL factors are concerned with developing the potential and performance of followers, individualising the type of leadership given. Factors include: idealised influence, charisma, inspirational motivation, intellectual motivation and individualised consideration. The process is said to incorporate the followers' and the leaders' needs, and responsibility is shared in the evolving transformational process (Bryman 1992). TL is one of the most researched approaches (Lowe and Gardner 2001), with empirical evidence that it works (Yukl 1999). However, criticism has been made of the assessment tool (Multifactorial Leadership Questionnaire, MLQ) (Tejeda, Scandura, Pillai 2001) and of a lack of conceptual clarity (Bryman 1992; Tracey and Hinkin 1998; Yukl 1999). Inappropriately used, the approach risks leadership which is antidemocratic, with charismatic leaders who motivate followers to exceptional efforts in achieving goals, in the setting of which followers have had little influence; a type of pseudo-TL involving coercion (Christie, Barling, Turner 2011). TL provides little prescription as to how leaders should act in comparison to SLII[®] and the lack of conceptual clarity meant that it was difficult to map data from this study to TL constructs. More importantly, arguably, was that there was no sense of overall fit with my reflections or with the participants invited to be critical friends (P2, P6).

A closer sense of fit emerged from exploring the concept of Adaptive Leadership (AL) (Heifetz 1994). The context of this study was that the environment of SLPN members had changed such that education could no longer be delivered in traditional face-to-face sessions and attending regular national meetings for peer support was difficult. The driver for change was initially external and an adaptive response was required. A significant part of the AL concept is to recognise the

difference between technical challenges and adaptive challenges, and those challenges which have elements of both. A technical challenge is something that has a defined solution, which can be resolved within existing processes and rules, or by bringing in expertise, and as such a leader should be able to resolve the challenge. An adaptive problem may be one that is harder to define, with multiple possible factors affecting the outcome. It is one which cannot be resolved through existing ways of doing things. It may require a change in people's assumptions, perceptions, attitudes and behaviours and cannot be resolved through a leader's authority. Some challenges may involve both technical and adaptive elements, and it is the application of the correct leadership approach to the type of challenge which is significant. The unique contribution of AL is the concept of a *holding environment* in which participants can feel safe to learn and do the work of adapting (Northouse 2016).

AL is a process approach, that is, it resides in the behaviours of, and interactions between leader and followers, rather than in the traits of the leader. AL is useful in terms of mapping a process in that it has six identified leader behaviours; these can be evaluated retrospectively to feed-forward and inform subsequent cycles of work. In Table 12.4-1 the concept's six steps are listed along with examples drawn from the present study. Considering the need for *maintaining disciplined attention* rather than a greater need for directive leadership changed my conceptualisation of the leader role for Cycles 4 and 5

The AL approach is consistent with an AR approach as it is used to "mobilise" people to adapt to change (Heifetz et al, 2009, p14). It focuses on the activities of leaders in relation to the work of followers within their context. Leadership activities are described as those that mobilize, motivate, organize, orient and focus the attention of others (Heifetz 1994). These descriptors aligned well with the descriptors used by participants in this study, in Cycle 2 (section 12.2) and subsequent interviews in Cycle 3 (section 12.3).

Table 12.4-1 Six steps of Adaptive Leadership in this study

Leader behaviour as defined in Adaptive Leadership	Description	As occurring in this study
Get on the balcony	Stepping back and taking a wider perspective on the challenge	Establishing an educational need and how it might be addressed (Phase 1 of this study)
Identify the adaptive challenge	Differentiate technical and adaptive challenges	Recommendations from Phase 1 included some changes that could be made within existing processes but, without additional resources, alternative (adaptive) solutions would be required.
Regulate distress	Help others see need for change without overwhelming - create a <i>holding environment</i> where people feel safe while learning. Provide direction, conflict management and productive norms. Regulate personal distress.	The reconnaissance period between phase 1 and 2 allowed a period of adjustment and agreement. Then the relational cohesion of the AR process created a safe space for learning and adapting to a new concept of educating and learning.
Maintain disciplined attention	The leader helps to keep people focussed on the work, recognising that doing things differently is emotional work.	This was identified as an area of weakness in the early cycles. <u>Identifying this element as <i>focussing attention</i> rather than a greater need for directive leadership changed my conceptualisation of the leader role for Cycles 4 and 5.</u>
Give the work back to the people	People feel comfortable with leaders telling them what to do but overly directive leadership can result in dependency and inhibit adaptive work.	By the third cycle some subgroups were already taking ownership of their work. The process of constant feedback in the AR process helped since it reinforced that it was their work and ideas, rather than mine.
Protect leadership voices from below	Listen to those who are not in the majority, to the out-group members or lower status.	Interviewing individuals who did not attend SLPN meetings, whether they were subgroup members or not, allowed their voices to be heard as anonymous data was fed back into the cycles.

As a relatively new leadership model, the underpinning theory of AL is described as formative and there is, as yet, little empirical evidence of its effectiveness. It was originally intended as a practical framework from which theory could be built (Heifetz 1994). A criticism of the framework is that it is not clear how the factors relate to one another to aid the required adaptive work. Within the medical context, Thygeson et al (2010) argue that AL is consistent with the current patient self-management approach, and give clear examples of how the factors relate to the clinical field. They reframe the doctor-patient relationship within a complexity-based approach viewing patients as complex adaptive systems, criticising that many medical problems are addressed as technical problems when they should be recognised as adaptive challenges for the patient. Thygeson et al (2010) claim that costs could be reduced by making healthcare more effective and efficient if this approach was adopted, highlighting that the approach maps well onto the familiar and well-researched trans-theoretical model (TTM) (also known as the Stages of Change model) (Prochaska, DiClemente, Norcross 1992).

AL offered an alternative conceptualisation of my role in this study. It was a concept which fitted with current thinking in patient management and was therefore easy for the participants of this study to understand. It aided in recognising that the busy work context of the participants meant that assistance was needed in *maintaining disciplined focus*, changing my perception of the type of behaviour they needed from me. That is, rather than needing more directive leadership which might reduce sense of ownership, what participants needed was regular refocussing on the requisite timeframe for tasks. This interim understanding was therefore taken into this fourth cycle and considered as new data emerged.

In conclusion, specific tools such as Kotter's 8 steps (Kotter 1996) can be useful in planning the development of an OLR by inexperienced participants. Ongoing practical guidance on leader behaviour is more usefully drawn from prescriptive leadership models such as the Situational Leadership model (SLII[®]) (Blanchard 1985; Blanchard et al 1993) and the more recent Adaptive Leadership theory (Heifetz 1994; Heifetz et al 2009). However it should be acknowledged that the theoretical grounding for these remain formative and further empirical evidence is needed to test relevance in different contexts.

As planned, this reading of leadership literature in relation to the interim findings was shared with critical friends (P2 and P6) on 28.03.2014. Neither critical friend would claim to have particular expertise in leadership theory but had leader roles as well as being clinical specialists. P6 was a physiotherapist and a subgroup participant, P2 was a nurse and a non-subgroup participant. The interpretations were accepted as being logical, with P6 concluding:

It all seems to make sense and seems to represent what has been happening.

P6, e-mail 30.03.2014

A short written summary was therefore e-mailed to SLPN participants and comments invited. No returned comments challenged the interpretation, most responding that it was interesting. The interpretation was therefore accepted as the provisional explanation subject to contesting data in Cycles 4 and 5.

12.4.4.2 Data collection and analysis

Additional to the review of the accumulated interim data in relation to leadership described above, the data for Cycle 4 alone were then analysed as in previous cycles. That is, with the themes identified and looking for new themes. The data for Cycle 4 were in the subgroup feedback sheets, intra and inter-subgroup e-mails and in the transcript of SLPN5 (June 2014). In addition, five subgroup members (2 LS, 2 DN and 1 GP subgroup) were interviewed and, over-running from Cycle 3, four end-users (2 LS and 2 GPs). The end-user data are reported indirectly since it was conceptualised as action cycle data for subgroups and considered along with other motivating factors.

At the start of Cycle 4, two theories seemed likely components of the model of OLR development, SDT (motivation) and CoP (social group structure). Therefore the data were first analysed for confirming and challenging (or alternative) findings in relation to these two components; and in what way they relate to each other: a) Motivation and sense of community. The next stage of analysis looked at b) leadership and c) learning and the relationship to other components of the proposed model.

a) Motivation and sense of community.

By this fourth cycle the study had been running for over a year and so motivation encompassed the notion of what kept people involved, as well as what got them started. What emerged was that the previously-reported personal motivational factors were supported, such as learning and anticipated competence-supporting factors, such as the perceived value of the OLR as an end-product. In addition many motivational factors were related to social aspects: of the subgroup, the SLPN, or the wider society.

For example, participant P5 described her initial motivation as being the creation of something that would enhance competence in her role, and learning a specific skill, interestingly recognising that it was also about setting up a new norm for the group.

...going by your referrals that you get for your patient ... some people understand what information you want and others don't, so that's a good opportunity for me, ...the information that I would like GPs to get ...this is an ideal way to get that message over.... And the fact that we knew it's not just a short project, it's something that we want to set up and then continue to review. So it's a skill that I was learning that I was going to keep using, so that keeps you going as well...

P5/int/51/13.05.2014

However, P5 expressed a further motivating factor was to raise the profile of the SLPN group. This sense of identity, as being part of a group and defining it to those outside the group, is consistent with both CoP and SDT theory.

I think it is a good thing ...to have a group ... who are recognised, and ... in the last few years we've tried to push that profile a bit better... it's practice support for practitioners who are in this field, but also we need to have a profile around Scotland and [to] the government.

P5/int/93/13.05.2014

In a different expression of the group identity, participant P10's reason for joining the study was an opportunity to give something back to the group which had supported personal development and, in turn, had the potential to support other new practitioners. The strong sense of an identified group/community, and the social learning within, is again consistent with Wenger's conceptualisation of a CoP (Wenger 1998).

I guess I just wanted to give something back to people ...who have helped me through all my learning experiences and projects I've done. But also to be able to contribute something to the lymphoedema practitioners in Scotland and to help them with their knowledge and experience, and giving them resources that they can use when they're stuck or struggling.

P10/int/126/13.05.2014

Although the sentiment expressed by P10 might be interpreted as a sense of duty, the voluntary and positive tone would suggest that there had been an internally-perceived locus of control. Not only was there conscious valuing of the goals, i.e. *identification* (Ryan and Deci 2000), but the tone was suggestive of an inherent satisfaction in being able to help which would suggest *intrinsic* motivation. An autonomous decision to help others satisfies the basic psychological needs identified in SDT of autonomy, competence and relatedness. SDT would suggest that the quality of learning and commitment would be expected to be better from such autonomous, intrinsically-driven decisions. Motivation is not a constant however, and Ryan and Deci described the possibility of several types of motivation co-existing and varying in relative influence (Deci and Ryan 2000; Ryan and Deci 2000). As the study progressed P10 described a different, and external, influencing factor of social obligation which would be more akin to Ryan and Deci's *introjection* (Ryan and Deci 2000).

...on a project if I've signed up for it, I'm in for a penny in for a pound, don't let the team down, so you just keep going and do what you can do and try and keep everyone else happy.....

P10/int/135/13.05.2014

In contrast, from the start, participant P20 explicitly described an obligation to participate as a sense of duty, which extended beyond her to the group as a whole.

....I think as a group we should be responsible for trying these things because actually as a group if we don't try them who else is going to do it?I do think we all have a duty to try...

P20/int/122/13.05.2014

In SDT, a person can *identify* with the organisational (group) goals. This produces extrinsic motivation with a *somewhat internal* locus of control, which is not about approval from others and there may be no organisational reward or recognition of the activity, but there is still a sense of obligation (Ryan and Deci 2000). The quality of learning from this type of decision would be expected to be poorer than with intrinsic motivation, even if the commitment to engage remains.

How these two participants (P10, P20) described their learning can be contrasted in the utterances below. Whilst P10 could clearly describe different types of things learnt (about transferable technical skills, the difficulties of communication in virtual working, and new clinical learning); P20 was less certain of the learning gained.

I've never had any experience in designing a website. That was a new thing for me ...that's also a positive because that's taught me a lot of skills that I never had before. It gave some ideas which will help other stuff.....I've learnt all about the Knowledge Network Community building. I guess I've learnt a lot about communicating in a team through e-mails, that was quite a new experience for me ... I even came across some new resources that you didn't know about so that was stuff you learnt as well...It's a good learning experience

P10/int/18/13.05.2014

I probably felt as if I've learnt when we're all together and we're putting things on it. I don't know that it would ever be something that I would be using again.

P20/int/161/13.05.2014

It would seem then that a strong sense of identification with the group may be more likely to motivate an autonomous decision to participate. A potentially confounding concept though, is implied by Wenger's (1998) description of a community being drawn closer together through involvement in a joint enterprise, engendering a greater sense of belonging. That is, sense of belonging is not fixed. In the interviews of Cycle 4 I explicitly asked if the study had given participants a greater sense of belonging. The responses were generally confirmatory but had some interesting variants. P10's response was typical of the participants who had been in geographically-dispersed subgroups.

... it gives us that extra special bond that we are this small group of people who've got this shared job and learning experience in common...; it's a good feeling being involved in a group knowing that you're creating something that's going to be used ...for years ... to come and something that will be appreciated as well. And just the whole experience of being involved ... to catch up with people from the SLPN ... and ...just the 4 of you in that group.

P10/int/185and224/13.05.2014

Participants P13 and P14 were in the same subgroup (DN), which was the single-location team. Whilst P14 confirmed a greater sense of belonging from participation, P13 did not.

It has brought me a little bit more into it because then you feel as though you're ... more involved with all the goings-on ...and the fact it's going to be ...a website that's representing the SLPN and all their work...it's made everybody work together...more. ... I think everybody has felt part of it that way because they've been consulted and they've had quite a lot of input into it as well and reviewed it along the way. So I think it's involved all the members quite fairly.

P14/int/102/08.06.2014

P13 reported not feeling a sense of belonging to the SLPN since she had stopped attending meetings; getting the news cascaded with the minutes did not give the same sense of belonging. She felt that an increased sense of belonging to the wider SLPN might have come from working with a more geographically-spread subgroup, having in-person contact with different members.

P13:you hear names but you don't know who people are ... It's just names that you know.

R: has doing this project made any difference to that at all?

P13: No, probably not, no. Because [of] doing it within this team.

Whereas probably if you were doing it with other people then it might have made you feel more [belonging]...

P13/int/163/08.04.2014

A change in participation level with the SLPN group, notwithstanding the functions of the study, also emerged in an interview with long-standing member P20. Unlike P13, who had no choice in ceasing attendance of the meetings, P20 described a voluntary withdrawal. Reasons given were partially practical, having to travel a great distance to meetings, an increased clinical workload and lack of managerial support, but there was indication of a separation of values and purpose.

I don't know how I see them [SLPN]. ...it's a long time since I've felt that I really knew where that group was going....things evolve.

P20/int/195/13.05.2014.

In a critique of the basic tenets of *participation* and *identity* of Situated Learning in CoP, Handley et al (2006) suggested that part of participation was about the fit between self-identity and perceived identity of the (SLPN) group. It may be that the sense of belonging is not so much how a member participates but the sense of fit.

For P10, the sense of belonging to the SLPN was a social concept, describing a good context for social learning.

Everyone's friendly ... approachable. You feel you could phone them, e-mail them, and when you're at the meetings you know you can feel free to discuss anything that you want to discuss. You never feel intimidated or excluded so yes I would say that do feel you belong there. They're a good group to be in.

P10/int/196/13.05.2014

The findings of the interviews in relation to belonging, identity and motivation were brought to SLPN5 (June 2014) to see if there was convergence, challenge or clarification. The following extract of the meeting transcript confirmed for the LS and GP subgroup members (P1, 6, 10 and P3, 5 respectively) both the additional external motivation of belonging to a small interdependent subgroup and the greater sense of belonging (described here as *bonding* and *cohesiveness*). For the DN subgroup members the issue of greater belonging remained equivocal; two further interviews of their members would occur in Cycle 5.

P5: I think it makes you respond to e-mails a bit quicker because you know 'oh that will be about the website' so you don't want to leave it...

P3: yes you feel responsible

P5: and get it done. You know if it's only one or two people you're working with.

P10: you see I think it's been good in a way that, especially if you're working people outwith your area you get to communicate with them a bit more which is nice and it makes you feel a bit more bonded to each other.

P1 and P6: yes

P10: some cohesiveness

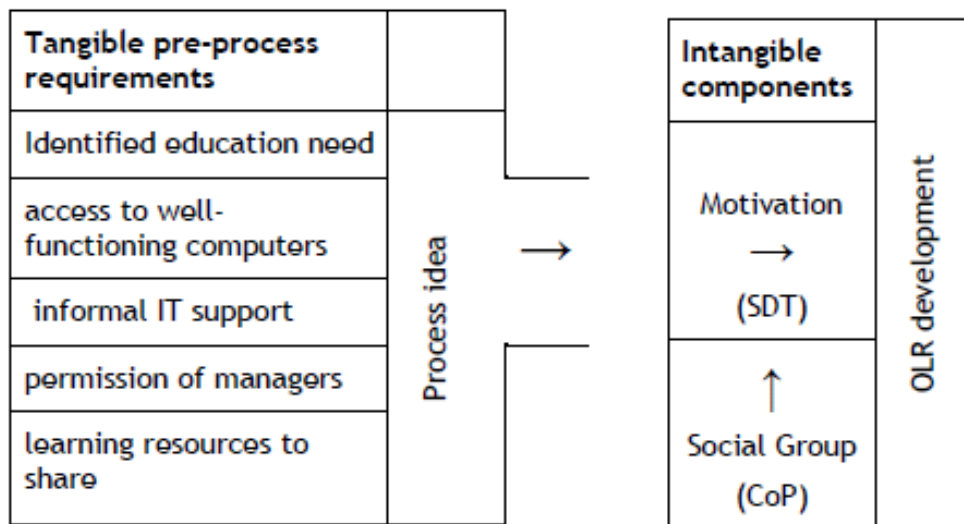
SLPN5/292/24.06.2014

The SLPN members concluded that the evidence to date would suggest that a sense of identity and belonging perceived by participants related to contact made with others outside of the working norm, but may also relate to sense of fit of self-identity to group identity. In addition, the SLPN concluded that the findings of this short cycle supported, as explanatory theories, the interpretation of SDT, with a key motivating factor being learning, and that the CoP nature of group had

influenced the motivation of participants principally through satisfying the psychological need for relatedness (belonging and identity).

Tentatively accepted, subject to further data in Cycle 5, was that through participation in a joint venture to address their needs as professionals and needs of the part of society they served, the process was satisfying a psychological need for autonomy and competence. The proposal was that the social group structure (CoP) was a significant influencer of the motivation (SDT) which enabled participants to use the more tangible factors driving an OLR development process (see section 12.3.1). This was represented in a draft of what was expected to be one part of the process model (Fig 12.4-1).

Figure 12.4-1 Early draft of one part of OLR Development Model



b) Leadership and its inter-relationships

During interviews with subgroup participants the words leader/leadership were not used as they could have caused an unintended construal of an autocratic style or of presumed superiority. In analysing the data, I interpreted leadership in its broader sense (Northouse 2016). My analyses in this section are presented in relation to the leadership literature presented above (section 12.4.4.1).

Participants were asked to reflect on the process of OLR development undertaken; some included the researcher role in their response. Many of the steps of AL can be identified in the description of my role given by P10, which included me identifying that meeting lymphoedema-related educational needs

was an adaptive problem, regulating the distress, maintaining attention, and giving the work back (underlining denotes coding).

You kind of had a vision and you kind of guided us toward that vision ... you ...let us do it our own way but did kind of steer us if we were looking a little bit lost which was good. You weren't overly forceful or you didn't tell us 'do this, do that, do that' then if we were a little bit stuck you would give us a little nudge in the right direction which was great.

P10/int/43/13.05.2014

Whilst the vision of OLR development may have been well conveyed, using Kotter as a framework (Kotter 1996), clarity of how to proceed on specific tasks was experienced differently by participants. This was even true for two participants (P13 and P14) who were in the same subgroup and had received the same information. P14 described having had clear directions.

... it's been quite systematic ... way at the beginning in the developmental stages and right through, you had a kind of guideline of exactly what you've to do and where you've to go with it which has been quite helpful. So we've known which direction to take it in.

P14/int/27/08.06.2014

Thus it seems S3 of SLII® was appropriate for P14 from the start.

However, P13 described a lack of specific instruction at the beginning.

... it was just knowing what was expected or what was to be done..., until we got that clear we were just stumbling...as it became clearer what we were trying to achieve then it did make it easier... we didn't have any sort of instruction at all. But no I think it was good to do it on our own, you were always there helping us and guiding us so that did help... I think it [ownership] would have been much less because you would have just been following orders and what we were told... It was nice to do it and find our way but I think the biggest problem was the time...

P13/int/39/08.04.2014

This extract implies that this participant needed the more directive style of the S2 type initially. This may have been due to different pre-existing skills and knowledge, but it may also be of significance that P13's interview was two months earlier than P14's.

Descriptors such as 'stumbling' should not be surprising since the AL literature indicates that *managing the distress* does not mean making it easy; in fact the work of adapting is expected to be difficult (Heifetz et al 2009; Thygeson et al 2010). There were times when, as an insider-researcher, such a stance was hard to maintain; it was not comfortable seeing my peers struggling. Heifetz et al (2009) do not offer specific guidance on how much distress facilitates the adaptive process. Indeed, the explanation of how the factors of AL theory inter-relate to bring about adaptive work is not clear. As an example of where the factors of the AL theory could seem counter-productive, I reflected that my regular e-mails to subgroups were *maintaining disciplined attention* for some, but adding to the distress for others (e.g. P20 below).

One of the problems of remote management was that I could not always gauge the workload (*distress*) of the receiver.

..frustration at not having the time to really think it through. And sometimes when there's a whole stream of e-mails coming through about it, it's just felt quite overwhelming for me sometimes. ...it's just like another pressure really.

P20/int/122/13.05.2014

When asked if a time schedule at the start of the study would have helped, P20, P10 and others said it was up to them to manage their time. According to P10 only extra resources in terms of ring-fenced time would have made a difference but that there remained a shared responsibility for how time was managed.

If you had ...allocated time it would have been much easier...[but] most of the people ...were actually the leads for their service so we probably just could have been more organised in giving ourselves protected time

P10/int/97/13.05.2014

Similarly P5 described leadership as a shared responsibility but, resonating with my previous thoughts, suggested that because of everyone's busy workload, a more directive style might be required between them.

I don't know if we need to be more 'right we've sent you this out please reply by 2 weeks' time'.

P5/int/80/13.05.2014

The group members taking a more directive approach amongst themselves is a different dynamic to the researcher doing so, and would be more consistent with 'giving the work back to the people' than directives from one leader. It would also be more consistent with a CoP context and the AR approach in my view. However, being directive with each other had not previously been the group norm for the SLPN and would require adaptive changes. For example, at the end of Cycle 4 the LS subgroup discussed with SLPN members (SLPN5 meeting 24.06.2014) how to encourage members to populate the LS community pages. When I suggested directly asking individuals for input related to their expertise the suggestion was redirected to the members present for a democratic decision on whether to take a more directive approach.

R: ...it might be better...to...directly ask one person at a time to put something specific on...

P6: I don't know, how do people feel about that, if we e-mailed you to say 'can you put something on it' or would you take it up if we e-mailed you all generally as a group and say 'will you please'?

SLPN5/24.06.2014

Subsequent to this meeting a few people were directly invited to submit specific resources to the OLR.

Both SLII® and AL are theories in which the leader enables the followers to a less dependent state, and are consistent with the aim of this study. Both explicitly relate the activity of the leader to the followers' needs, the first in terms of competence and commitment, the second in terms of the less specific needs. However these theories do not give the follower's workload the same import as do

the participants of this study, unless assumed indirectly, as a factor of competence.

The implication drawn from this study for an individualised leadership would be an additional requirement on the leader to understand the broader workload of the followers and their capacity to manage it. That is, not just competence and commitment to the tasks of the project but also competence within the complex environment of their work and life. This would involve regarding followers, or in this case peers, as self-organising complex adaptive systems in the same way as Thygeson et al (2010) conceptualised the doctor-patient relationship. Literature taking a complexity theory stance into leadership such as Obolensky's Complex Adaptive Leadership (Obolensky 2014), has only emerged in the last few years and has yet to be researched empirically or build up the case-history of older theories (see Somekh 1995; section 10.2.2). Such a relationship requires a significant investment of time and, long-term, may be unrealistic in large groups, particularly where workers are remote from the leader. Further research into the possibility of structuring processes to create 'virtual localities', without creating incompatible hierarchy is warranted.

In this study, the division of a larger group into subgroups reduced remoteness without creating additional hierarchy, and a cyclical development process with multiple forms of feedback provided opportunities for social learning. This engendered ownership and a more sustainable democratic form of leadership. The inter-relationship of leadership, learning and social construct in this process mitigated some of the problems of remote working and lack of extra resources, such as protected time.

The proposal therefore for the underpinning theory of leadership, within the developing model from this study, is that the basic tenets of SLII[®], as described here, are used within a wider concept of AL to support the understanding of the needs of the followers. This new integrated theory of leadership would require further research to understand its explanatory and prescriptive strength, but it was taken as a working theory into the fifth and final cycle of this study.

c) Learning and its inter-relationships

Reflecting previous findings, Cycle 4 interviewees described learning as a motivation to participate in the study, and as a source of continued impetus. The central importance of feedback for practical OLR modification and for learning had been interwoven throughout the data of the previous cycles, and indeed in the design of the study itself. However in the Cycle 4 data I was particularly interested in how participants had gone about the learning, what they felt they learnt, what had influenced that process, and whether the data would further indicate particular learning theories to inform our model of OLR development.

Constructs from several different learning theories were interpreted in the participant interviews; this is consistent with the multiplicity of learning theories currently underpinning medical education (Mann 2011). Interpreted in the data were:

- descriptions of using scaffolding and worked examples
- social construction of knowledge
- the OLR as extension of social learning
- learning by making tacit knowledge explicit
- potential learning through heterogeneity of groups
- involvement (participation) as a requirement of learning
- transformative learning

Participant P10 for example described starting from a place of familiar clinical resources but unfamiliarity regarding websites and constructing his knowledge using resources available. In terms of learning theory this could be described as the scaffolding of constructivist learning. The use of the plan and mock site on KN is similar but, on the other hand, could be described as a worked example as used in CLT (see section 12.2.5.2; and further discussion of learning theories in Cycle 5).

... I've never had any experience in designing a website....it's our subject so that's kind of helped us. Because we've had the knowledge and the resources kind of lying round about us. It's just been a case of kind of pulling them together and working out what to put there. It's been useful having you there,... and ...the fact that we had the Knowledge Network and they already had the design for it. So we could follow the plan that they had and ...the mock site ...get ideas from them for inspiration and guidance.

P20/int/28/13.05.2014

From this extract it is difficult to delineate whether the learning is an individual cognitive process in a social context or a truly social process of creating joint meaning. However, in other interview data a social construction of the knowledge was more obvious, e.g. brainstorming.

P13 described her subgroup members moderating each other on OLR content, in terms of depth and coverage, and during the process challenging each other's clinical rationale. The extract below describes how populating the OLR was an opportunity for creating a new understanding of their knowledge via discursive social learning, as might be described in social constructivist theory or indeed situated learning (Vygotsky 1978; Lave and Wenger 1991).

...when we were doing the script [for the video] ...there was a lot of discussion ...a couple of times had the books out...to sort of clarify things. ...'Well I don't do it like that', 'well why don't you do it like that?' ...the four of us ...trying to come up with the way that we were going to put it across. And why we did different things...

P13/int/253/08.04.2014

Extending on this experience P14, of the same subgroup, saw the discussion forum being created in the OLR as a means of continuing this shared learning and sharing of best practice. Further, that the social learning could maintain group cohesion. In a model of component relationships this would suggest that the *learning* influences the *social group construct*. Whether P14 expects the learning to be the legitimate peripheral learning of Situated Learning described by Lave and Wenger (1991) or an extension of personal knowledge through the zone of proximal

development in social construction, described by Vygotsky (1978), cannot be distinguished.

...because across the different health boards different specialists can be maybe doing different things ... it's good to keep updated. If anybody hears of anything new ... you can discuss with other specialists ... shared amongst the wider specialists group quite quickly. ...the website would be quite a good way of doing that. As SLPN [meeting] is only every 3 or 4 months then it's a way of keeping the communication going between... especially because some of the areas are so widespread and so remote ...I think it's a good way of keeping everybody together that way.

P14/int/125/08.06.2014

One of the difficulties described in the task of subgroup development of OLR was making expert clinical knowledge comprehensible to less expert users. In the workplace this might simply be shown and not need articulating (Eraut 2004); but both P13 and P14 recognised this requirement for articulation as a means of learning.

.. it's actually quite good when you're all sitting down together and able to vocalise things across to each other and work things out.

P14/int/93/08.06.2014

...because you do it without thinking ... What you do and how you do it and you have to really... slow it down ...breaking it down into slower steps you have to think about it...having to say it out aloud together was a learning thing in itself.

P13/int/267/08.04.2014

Extrapolating from this, P13 suggested that, had she been working with people outside of her normal team, this learning might have been greater. The increased learning from diversity or heterogeneity of CoP members is recognised as a factor increasing learning but can also cause tensions from cultural differences (Wenger 1998; Pan and Leidner 2003; Handley et al 2006).

...other people might have something different, so you maybe would learn something... [to] think just a different way, to do something...in a different way

P13/int/280/08.04.2014

However, for P20 of the LS subgroup perceived a lack of involvement, leading to a feeling that she had not learnt as much. She had only been able to meet up with her subgroup once and technological limitations meant she could not upload content. Much of learning theory is based on learning-by-doing, but what seems to be emphasised in this utterance is the lack of involvement - suggesting that, for P20, the social component may be more of an influencer than the activity. Involvement or participation is a key aspect of learning through CoP; what is more, a review of literature relating to online CoP by McCartney, Hooker, Cordeiro et al (2012) described the necessity for a type of organic involvement so that people's participation is not prescribed, but can develop organically and individually.

...there would be things that I have learned and that's probably just been more about how to use new widgets for all these things,...our group would have learnt things, some of us probably more than others because XXXXX [P6,P1 and P10] they can put stuff on [the OLR]. Whereas you don't feel maybe the same involvement, when you're not actively needing to do anything.

P20/int/166/13.05.2014

Participation in creating the OLR had led P14 to reconsider her regular teaching preparation, in particular the concept of tailoring (see also discussion of motivation in section 12.3.4.3).

... widen my scope a little bit and ...finding out more about the people that you're teaching ... and exactly what they're using as well. ... actually tailored to what they need. I think the fact that they give feedback about what they want to be available ... makes you think ... these things definitely need to be covered..

P14/int/65/08.06.2014

A long-term change to professional practice from taking part in AR is described as transformative learning (Coghlan and Brannick 2014). The transformational capacity of AR was discussed earlier (section 10.2.3).

In summary, the findings of previous cycles, of learning as motivation and of the central role of feedback, were expanded in this fourth cycle to include several learning theories. There was emphasis in Cycle 4 on social forms of learning but previous cycles had shown that individual learning was also perceived. The question of whether particular learning theories had greater explanatory power for the findings of this study was carried into the fifth and final cycle.

12.4.4.3 Evaluation of the cycle

As in previous cycles my interpretation of the data, including the comments of critical friends, were presented for critical discussion SLPN5 (June 2014). As previously described, the interpretation in relation to leadership was accepted. The group evaluation of the practical parts of this short cycle was that it had gone as planned; useful and positive end-user feedback had now been achieved and the OLR had been edited accordingly. The evaluation of the learning from this cycle is reported below (section 12.4.5).

It was agreed that SLPN5 would be used for members (including non-subgroup members) to collectively review the OLR, page by page. As preparation, a pre-meeting reminder was e-mailed to encourage members to individually review the pages before attending. Members who were not attending the meeting were encouraged to participate by e-mailing comments. SLPN5 was also used to address the questions of the sustainability and launch of the OLR, and to reflect on the effect of the study on the SLPN as a group.

Evaluation of the OLR

The evaluation of the OLR included reviewing the contents of each page and checking access to videos and hyperlinks from different technology and via different firewalls. No significant problems or disagreements emerged and it proved to be useful for refinement of some subpages where subgroup members had been equivocal about wording or detail of content. Indeed there was a great

deal of affirmation and positive feedback for the subgroup participants from members outside their subgroup.

P26: just from the outside it's masses of work you've done [addresses all] well done you, given that we're not an IT team and suddenly we have this whole website. It's really good.

SLPN5/723/24.06.2014

One of the difficult issues in the first two cycles was the concern over putting teaching presentations which included patient photographs in the password-protected community for specialists. This issue was revisited and clarified in this evaluation. The difficulty was that members had presentations which included patient photographs with limited-permission, that is, to be used for teaching but not for open publication. Further, some permission forms expressly stated that they were for use only by employees within a specific health board or organisation. The group agreed that consent for open publication was the safest level to use despite being in a password-protected part of the OLR.

P6: I would be more comfortable if it's only people who have consented for publication at the moment. Then they know that it's going out anywhere. Sometimes your patients say just for teaching and you can control that but I think if you were putting that on the website it should be for publication.

SLPN5/112/24.06.2014

An interesting pre-meeting change to the SLPN group was the addition of a doctor. This came about because of the study. Having received end-user feedback from two GPs at the start of Cycle 4, the GP subgroup had made changes to their pages and we had started recruiting further GPs for a second wave of feedback. One of the doctors approached to participate (P29) was interested in the SLPN and the developing OLR, and after some discussion was invited to attend the next meeting. Having observed the group evaluation of the OLR, P29 was able to contribute a doctor's perspective first-hand and suggested additional resources which were subsequently added to the OLR. In the interaction below, the doctor's suggestion is immediately legitimised by the sharing of relevant experiences by

SLPN members. Also of note is the sense of ownership from P26, even though she was not a subgroup member.

P26: ...XXXXX [P29] is there anything from a doctor's point of view you think you would want?

P29: there's a lot about managing red legs ...how do you differentiate between cellulitis and chronic venous eczema and things like that... we've got a Red Leg Protocol in XXXXX[city] which is on the intranet. Which is an algorithm of how to manage it and...I'll ask the consultant about it, whether he would be willing to share it. I think that would be helpful clinically.

P26: because I think a lot of GPs prescribe antibiotics for bilateral red legs [unnecessarily]

P8 and other SLPN members: Yes, quite often.

P26: yes because I saw somebody yesterday... [recounts story of misuse of antibiotics]

SLPN5/468/24.06.2014

Completing the fourth cycle also meant preparing for the final cycle of the study. Two subjects which needed renewed discussion were sustainability plans and the launch of the OLR. By this stage of the study members had a sufficient idea of the processes involved and of the finished product to plan meaningfully.

Sustainability plans

The somewhat surprising finding in discussing sustainability was that many participants wanted to continue as subgroup members in order to carry on learning. There had clearly been some consideration of future updating of sections.

P1: ...I would have thought that the DN and the GP one [OLR pages], ... you're really only going to change it if something gets updated.

P3: ... I don't mind continuing with the GP one because also I don't feel I've done that much. I probably could learn a bit more with it so...

P5: I'm the same.

SLPN5/248/24.06.2014

In addition P26, who had not been available in the previous year to be a subgroup member, volunteered to pull together a subgroup of SLPN members to develop OLR pages for physiotherapists. Self-identifying a training need, P26 asked subgroup members how they had learnt. They responded by describing a combination of training, self-directed and exploratory learning, and peer-learning. However, the suggestion was made that shadowing someone would be better, implying an apprenticeship model but consistent with social constructivist theories.

P26: how did you learn how to manage the website in the first place?

P1: we got some training from Knowledge Network

P26: and you guys got it from XXXXX [the researcher]

P3 and P5: yes

P10: and we just played about with it didn't we

P1: we just played and foutered³ about with it you know

P6: but it's something I think you'd pick up better from shadowing someone.

P1: yes because there was only me and you [P6] who did the actual training and then we showed you [P10] what you to do didn't we?

P6: yes and then we just played on it till we got the hang of it.

SLPN5/257/24.06.2014

The physiotherapist pages were developed by a new subgroup initiated by P26, after the end of this study, adding further value.

A further unexpected development during this period was that the SLPN was offered a donation from a family who had become aware of the SLPN through the previous very basic website. The family were anxious that their donation improved the care of patients with lymphoedema. After discussion with the family it was agreed the SLPN, who previously had no financial resources, would investigate the implications, and if permissible would use their donation for additional technical and legal support for the OLR from an independent company. To avoid any conflict of interest I was uninvolved in this decision. The decision

³ Foutered is a Scottish word for fiddling/muddling

was practical substantiation of members' belief that the OLR would improve HCP knowledge and therein patient care.

Launch plans

I described the difference between a soft launch and high-profile launch and suggested a discussion of the benefits of each.

R:...you can have what they call a soft launch... or you decide a certain date and you make a very public thing of it and you announce it in the ...newsletters and the web things ... and the GP news alerts and...

P26: When is the BLS lymphoedema awareness week? [a national event]

P5: I would go for the public...

P1: I think it would have a better impact

P5: because we've had a website for a wee while in the form that it was in, so we might need to get out there and tell them that it's there.... So we might need that launch...

SLPN5/135/24.06.2014

The high-profile launch was agreed to coincide with BLS Lymphoedema Awareness Week. P5 invited members to volunteer for promotional tasks e.g. notifying stakeholder organisations. I interpreted the discussion regarding the launch as proxy measures of SLPN ownership, confidence and satisfaction with the OLR.

Effect of the study on the SLPN

When asked what effect the study had on the SLPN, greater group cohesiveness was mentioned again, but the first response was regarding the modification of the constitution in relation to membership criteria.

P6: I suppose it's made us think about the membership again hasn't it because of doing the bit for the specialists we've had to look at the criteria for membership.

SLPN5/290/24.06.2014

The SLPN Constitution was re-worded over the remainder of that year but did not reach final accepted form until the following year. The new wording clarified that

the SLPN membership was wider than those who attended the meeting three times a year. Membership was open to all HCPs who provided lymphoedema or chronic oedema services for NHS Scotland. In addition, it included those who conducted related research or provided accredited education in the field.

12.4.4.4 Summary of evaluation of Cycle 4

The group evaluation of the actions of this cycle concluded that our aims had been achieved. A review of the data in relation to leadership literature suggested that Adaptive Leadership theory was useful to the model of OLR development, but that incorporating Situational Leadership II was useful to identify follower needs. As newer theories, such as Complex Adaptive Leadership, were supported by empirical evidence, these would need consideration.

The SLPN members were sufficiently satisfied with the OLR to plan for a high-profile to coincide with BLS Lymphoedema Awareness Week. The fact that many subgroup members expressed a desire to maintain their OLR pages was not only an indication of their ownership, but also a good indicator of its sustainability. An unexpected donation to the group meant there would be a small additional resource to help long-term security of the OLR. This addition was not crucial to the sustainability of the OLR but was very welcome.

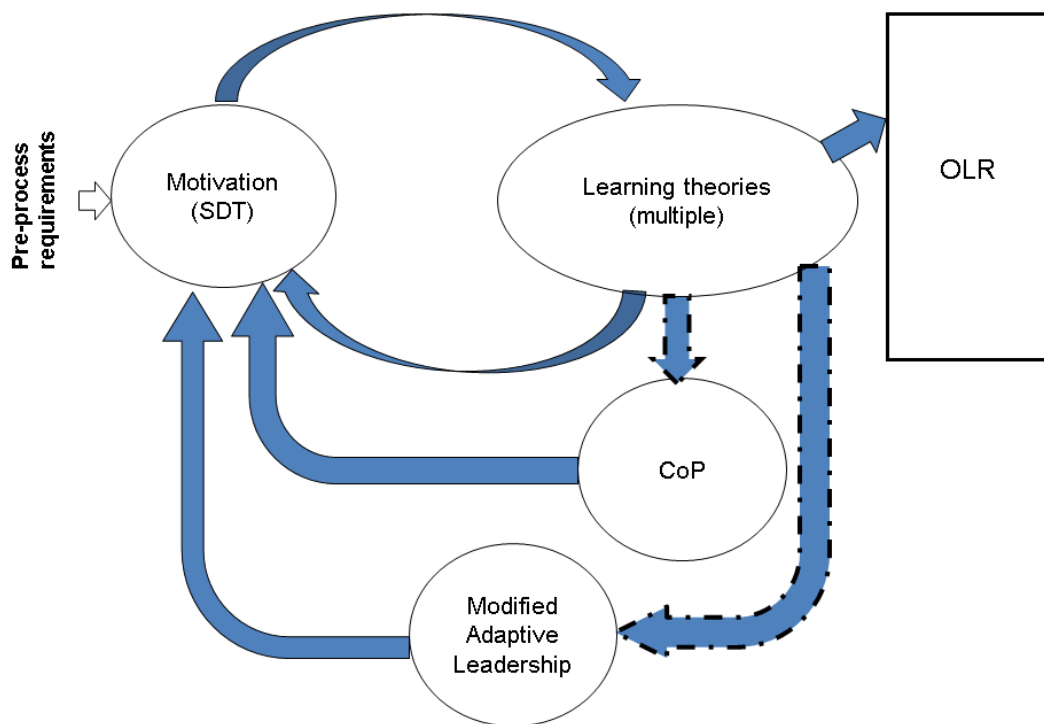
12.4.5 Specifying the learning: discussion of Cycle 4.

In Cycle 4 we aimed to understand the key components of a model of the process of OLR development and how they related to each other. A noteworthy sub-question which had emerged from the previous cycle was how leadership theory could inform this study, given that the group's egalitarian norm would seem antithetical to a leadership component. Relating the interim findings of the study to the literature proved useful in reframing an earlier interpretation, that of insufficient directive leadership, to an understanding where, in addition, there was a need for more learning support initially for some participants and continued maintenance of focus for busy participants.

The components of a model, suggested by the findings by the end of the Cycle 4, have been argued to be Motivation (based on SDT), Social group construct (based on COP), Leadership (based on AL, incorporating principles of SLII®) and Learning (multiple theories). Therefore, learning is the component needing additional explanation from a further AR cycle. In the proposed model, motivation is driven by pre-process requirements - the identified educational need and practical pre-requisites as depicted previously in figure 12.4-1.

A draft model therefore emerged (Figure 12.4-2) to be tested in the final cycle.

Figure 12.4-2 Draft model of OLR development



Explanation of the draft model.

The draft model was an attempt to capture the relationships, as understood after four cycles, between the components identified in the process of OLR development by HCPs.

Pre-process requirements to motivation included the recognised educational need and change in contextual circumstances (meaning the old way of doing things was no longer possible). In addition, existing assets such as computers, teaching resources (including a small amount of teaching time), support of managers and an idea of a possible process for addressing the problem, influenced the motivation initially.

Motivation was also influenced by a sense belonging or duty to the SLPN as a group, identified in the model as a CoP. The CoP provided a motivation-enhancing peer group support, which was particularly sought when the learning need was greatest. The CoP can therefore be envisaged as both a driving and a supporting influence on motivation. In addition, a supportive and guiding leadership style was needed from the researcher in the early cycles to maintain the motivation. Consistent with SDT (Ryan and Deci 2000), a psychological need for autonomy, competence and relatedness was interpreted as motivating the participants' learning.

Learning was interpreted as both an individual and social activity. Motivation to learn was a consistent finding throughout the study. Similarly, the sense of learning and competence gained was described as motivating. Competence was interpreted pragmatically, in that participants were increasingly able to independently create and edit OLR-pages and progressively rely less on face-to-face contact. A reciprocal relationship between motivation and learning was noted, which has previously been described in education literature (Schunk, Meece, Pintrich 2014). As confidence increased, the reliance on peer group and researcher support reduced, as did reports of time restrictions, supporting the previous suggestion of Cognitive Load Theory (13.2.5) as partial explanation for limits on learning. The connectors (arrows) between Learning, and both CoP and Leadership, are shown with a broken line to indicating a lessening demand.

A modified Adaptive Leadership approach aimed to help participants adapt to a new way of interacting as a group and of delivering education. As their sense of competence increased, the style of leadership could change from supporting/guiding to maintaining the focus of competent participants, therein incorporating some basic principles of SLII®. Appropriate leadership was interpreted as being key to initiating and then maintaining the motivation to continue. The relationship of

leadership to motivation therefore does not reduce but changes; the connector is therefore shown as a continuous line. The relationship between leadership and learning is conceived as being mediated via motivation, hence the arrows are unidirectional from learning to leadership and from leadership to motivation.

Community of Practice (CoP) as a conceptual framework (Lave and Wenger 1991) was useful in understanding the core of the group (those who regularly attended the meeting). The concept of boundary members was useful to explore with non-core members (Wenger 1998); also whether my role as researcher, positioned me as a boundary worker. These ideas were developed further in Cycle 5. Largely supported in this study were Wenger's (1998) descriptions of an enterprise increasing the sense of belonging in a group and the community providing both emotional peer support and opportunities for peer learning. Although the learning might be described as occurring within the CoP, increased competency reduces the peer support needed but, as the model shows, a relationship between CoP and motivation-to-learn is maintained. The relationship between CoP and learning is conceived as mediated through motivation hence all arrows are unidirectional.

With a draft model in place by the end of Cycle 4 it could be carried into the fifth cycle to see whether it provided a sufficient explanatory framework for the data of Cycle 5.

12.4.5.1 **Summary of findings and questions emerging from Cycle 4**

Following the fourth AR cycle the model of OLR development by HCPs in the given context had four main conceptual components over and above more tangible process requirements. Findings further confirmed SDT theory of motivation (Ryan and Deci 2000) and CoP (Lave and Wenger 1991) as useful explanatory components. Adaptive Leadership (Heifetz 1994) provided the best fit of different leadership theories explored with the group, but the addition of some principles from Situational Leadership II (Blanchard 1985) aiding the understanding of participant need as they learned. Future empirical research on Complex Adaptive Leadership (Obolensky 2014) may inform future versions of this model. Multiple learning theories were invoked, both individual and social. Further interviews in the last cycle could better explore the learning achieved from the study and what it might have to say to the education field more broadly. Further, subject to the

above clarifications, the findings of Cycle 5 could be tested against the proposed model to establish its explanatory strength.

12.4.6 Question to address in next cycle

The main question for the next cycle therefore became:

What learning was experienced in modelling the development of an OLR by HCP and how might that inform education theory?

12.5 Cycle 5 June 2014- Sept 2014

12.5.1 Question driving this cycle

What learning was experienced in modelling the development of an OLR by HCP and how might that inform education theory?

Consideration of several learners and types of learning occurred within this study. There was the participants' declarative and procedural learning from collaborating on OLR development and from participation and reflexivity in an AR study. For some, including the researcher, there was also reflective learning about themselves and the social group. Another type of learning considered was that of the end-users and how it could be facilitated. In this chapter, the focus will remain on further understanding the participants' learning during development of the OLR, and the relationship of that learning to other components of the proposed model from Cycle 4. This will be followed in the next chapter by a broader discussion of the learning from the study as a whole.

Underlying the main question for Cycle 5 therefore was the sub-question:

In what ways do the data of this cycle confirm, challenge or adapt the proposed model of OLR development?

12.5.2 Planning process

The plans for this AR cycle were agreed at the end of SLPN5 (24th June 2014) which was the last SLPN meeting within the study period. The final three months of the study would take the group to the launch of the OLR and allow a brief period for reflection.

Action plans: During this cycle we planned that I would interview 6 further end-users:

- 2 GPs and 1 LS regarding the GP pages of the OLR
- 2 Community nurses and 1 LS regarding the DN pages.

As the LS subgroup had opened its LS community pages on KN to the membership during SLPN5, feedback started happening naturally, making end-user interviews about those pages unnecessary; however, I could ask about intention-to-use within the planned participant interviews.

In the meantime, all subgroups set aside time to make changes to the OLR in response to the end-user feedback before launch week. Plans for publicity and notifying multiple stakeholders of the launch of the OLR during BLS Lymphoedema Awareness Week (15th - 19th September 2014) were outlined at SLPN5 and distributed to non-attendees via the minutes of the meeting of that meeting.

Research plans: During Cycle 5 the plan was to interview the remaining subgroup members (P3, P6, P8, P9) and to interview two further non-subgroup members (P17, P19). In addition, I planned to conduct repeat interviews with a sample of three subgroup members (one from each subgroup) to explore differences in their description of the experience over time and to include questions that had changed over the cycles (v1.0 and v2.0, Appendix 16). One repeat interview did not occur due to lack of availability. As previously discussed, the analysis of Cycle 5 data would be an individual process (section 10.3.1), as is consistent with AR used in pursuit of individual academic accreditation (Coghlan and Brannick 2014).

12.5.3 Actions taken in OLR development

Six end-user interviews were conducted by telephone (P17, P26, P28, P29, P30, P31), and responses collated and anonymised before being returned to the appropriate subgroups. The feedback from community nurses and doctors was very positive regarding content and navigation of the OLR, requiring very minor changes. However, feedback from non-subgroup LS (P17, P26), on the GP and DN pages respectively, had detailed constructive critique. Peer critique within SLPN had previously been somewhat lacking as noted in earlier cycles, therefore this was a change to intra-group behaviour. The agreed procedure was for subgroups to discuss the feedback internally and, if there was rejection of a suggestion, the rationale would be fed back to the SLPN group as a whole via e-mail to give wider opportunity for views to be ascertained. Otherwise, appropriate changes were made to the OLR. The plans for the OLR launch are described in section 12.5.4.3.

12.5.4 Data collection, analysis and evaluation of action

12.5.4.1 Data collection and analysis

The data sources for Cycle 5 were the interview transcripts of six subgroup members and two non-subgroup members, the RD, intra- and inter-subgroup e-mails and SLPN-wide e-mails (related to the OLR).

Analysis was initially inductive and thematic to identify new themes in relation to the cycle question or the overall research question. The draft model of OLR development was then used as a framework for deductive analysis to identify support for and challenge to the existing components of the model and their inter-relation.

12.5.4.2 The learning described by interviewees in Cycle 5

12.5.4.2.1 Learning, level of participation and manager benefits

I anticipated that a lower level of engagement would mean that the two non-subgroup members would describe less learning than the subgroup members interviewed. For example, having had little involvement since Phase 1, non-subgroup member P17 reviewed the OLR during Cycle 5. When interviewed she conveyed how useful the OLR would be to her as a LS and that it contained much needed information for GPs, citing examples of problems from clinical practice. Unsurprisingly, having been unable to attend most SLPN meetings during this period, P17 described no learning from the study. It seemed reasonable that those with greatest opportunity to learn were those directly involved in subgroups and those attending meetings.

A consideration of how learning for outer members could be improved in future studies may be worthwhile, accepting some people may have chosen to engage only as boundary workers (Wenger 1998).

The second non-subgroup member, P19 was a service manager and LS, and gave a wider perspective on learning from the OLR development and the resulting OLR. She stated that her staff member (P10) had a good learning experience from working in a subgroup with different professionals and that the OLR was a potentially useful form of socialising new staff to the speciality. This would be

consistent with CoP theory (Lave and Wenger 1991). It is interesting to note that both elements valued by this manager were social forms of learning.

...XXXX [P10] has found it a learning experience... to work in a group outside the normal working group...that's always good experience.

...[the OLR] is somewhere that we can direct our new staff when they come on board, so that will be a useful learning tool. ...as a new practitioner you're probably going to make more use of the site ...it is a useful forum...you might meet other people who are at the same stage as you, ...it's a way of being part of a bigger team...

P19/int/52/06.08.2014

Further, P19 had anticipated that the study would distract participants from clinical practice causing service disruption. She was pleased to report that this had not been the case; confirming our aim of working within existing resources.

...it hasn't interfered with our working practice or delayed patients being seen ...

...the project as a whole hasn't impacted on me personally or the service hugely so I would count that as a bonus. Sometimes projects ... take up so much time that hasn't been the case, so that's a positive.

P19/17and87/06.08.2014

Indeed even the opportunity cost of time taken up during SLPN meetings, which P19 had attended, was considered worthwhile in the long-term, but this was conditional on the OLR being well-used subsequent to the study. Despite her peripheral engagement, the activity was meaningful to her, reflecting Handley et al (2006), and an inclusive group ownership was expressed, saying that the SLPN (including herself), had a responsibility to promote the OLR.

...although it's taken up time [at the SLPN meeting]...I don't think it will take the same amount of time ever again... from a negative...point of view...other things perhaps have not been discussed ... but we meet often enough for the group that I don't think that will have a huge impact. ...we have to be very proactive about getting it out there otherwise it will have been a waste of time and it would be a shame.

P19/int/40/06.08.2014

Few interviewees spoke of having, or not having, managerial support. One exception was P20, who in Cycle 4 described the difficulties of not having support and the negative effect it had on flexibility to participate. In the Cycle 5 interviews, P1 and P11 stated that their managers were pleased they were involved in research. For P1 this fulfilled a requirement as specialist practitioners to be involved in research. For P11, the managers were also interested in the OLR as a form of kudos.

I think from my manager's point of view it was more ...that I was taking part in research which is part of my role anyway. So if you're ticking that box...

P1/int/128/05.08.2014

...it's a tick box for our managers ...that we've been part of this [research]...and that their team has been involved in developing this fantastic website. Not many services can say they've done something as grand as this.

P11/int/90/12.08.2014

In terms of SDT as a theory of motivation, an organisational requirement to participate in research might have been experienced by P1 and P11 as an external regulation, giving their motivation an external locus of causality (extrinsic motivation) but neither interviewee described such feelings. In her first interview P11 had described a more internal locus of causality (see below) and P1 described valuing the activity such that, even if interpreted as organisational goals, identification with, and self-endorsement of, the goals had occurred.

...that was the driver for me, I could see how this was ...going to be something that was needed and wanted, and for us as well ...it'd possibly make my job a lot easier because I could signpost quite easily. But I would be hoping that ...it would have an impact on the patient... if this OLR is utilised by these generalists then ...it would make things a bit easier and they would get the information they needed without having to pick up the phone quite so easily.

P1/int/104/05.08.2014

...when you open up the website ...seeing your information on there, that's quite a good feeling, to know that what you're doing's going to help others and help other patients.

P11/int/48/26.02.14

An internal locus of causality would be consistent with autonomous participation and consistent with the enthusiasm of both participants for the OLR development.

Previous non-subgroup member interviews were conducted in Cycle 3. The main findings from these had been the anticipation of benefits from the OLR but even at that mid-study point, participant P18 had described what might be considered social peripheral learning from being part of discussions and cycle evaluations at SLPN meetings. One difference between the previous interviewee (P18) and the current interviewees (P17 and P19) was that P18 had been able to attend all SLPN meetings and therefore had a greater opportunity for participation. Indeed in her interview, P18 was very candid about the conscious choice of participation level.

...at the time I knew that the ICT group [another project] was going and I was starting my education project at the beginning of this year and I had to focus on those so, it meant that my time was limited... but I quite like being able to dip my toe in and be part of the process... wanting your cake and eat[ing] it I suppose.

P18/int/145/19.12.2013

On the whole the findings suggest that SLPN members were able to participate at their preferred level and as such the design of the study was supportive of autonomy. An exception was geographically-remote P9 who had selected to be in the DN subgroup but online communication had been unsatisfactory.

I personally found it frustrating because I was in that subgroup, and everybody else was able to get together, so I felt very much on the outside. So unless I saw something that I felt particularly strong about then I didn't really comment and then I really didn't have much input into it... but the notes from those meetings were good.

P9/int/19/18.09.2014

Rural clinicians were generally familiar with videoconferencing equipment but better availability and familiarity among urban clinicians may have made communication with remote/rural members better and is a practical consideration for future studies.

P9 described some technical and clinical learning but in addition a form of meta-cognition of the group process.

...because I was ...on the outside of one of the subgroups it was interesting how they worked. And ...just how the [sub]groups worked, just peoples' experiences showing in the differing ways that people work....I learnt about developing websites, a bit, ...and ...information about different treatments.

P9/int/133/18.09.2014

The resulting boundary position of P9 enabled a type of critical friend function, with an overview of the study and the researcher-as-leader role. Interestingly, in summarising her learning, she listed many of the key themes identified in the study: leadership, motivation, time and the importance of the quality of social contact.

I think you need a driving force, you need people who are committed to doing it; to have the time available for the development of it would certainly be very helpful. And I think the, getting together face-to-face somehow is very important, whether that is through VC [videoconferencing] or actually physically face-to-face. As a whole I think it worked very well and I think a good resource was developed.

P9/199/18.09.2014

Given the emergent importance of autonomy in the findings I was interested in her impression of the balance of participant willingness or coercion. P9's response affirmed the voluntary nature of involvement, and confirmed the education need as stimulus for the motivation.

If people hadn't been willing to do it, they wouldn't have done it. Because there wasn't any need for them to do it. So they had to be willing to do it and willing to have that input and I suppose an acknowledgement of the need for the resource as well. Because that was very much part of why the group did sign up to it.

P9/int/97/18.09.2014

Following on from the willingness, was the question whether the democratic ethos of AR as co-development had been achieved. I asked whether, in her opinion, the SLPN had taken ownership of the OLR design or had merely implemented my suggestions. Her interpretation of e-mail communication and meeting notes was that objection was more likely to be voiced than suggestion, but that on balance the result was even.

I think if there was something that you suggested that people weren't happy with then there were certainly comments about that. And the comments from the e-mails, there were certainly ways that it developed that perhaps, that you hadn't suggested. So I suppose it was 50:50.

P9/int/109/18.09.2014

The critical acceptance of my suggestions was confirmed by P8 who described that the DN group saw my input as an essential prompt, support and guide but would not necessarily take on my suggestions on content or design.

There were sometimes we listened and then there were times when maybe we didn't think some things were just as important, or we didn't want to change some things. ... when you were in touch ...it was a constant reminder that we just had to keep going. Had we not had that we may not be where we are today. ...along the way you were very supportive and you did give us good guidance.

P8/int/243/12.08.2014

Learning from reflecting on the process of OLR development was not only achieved by those who were on the periphery of the work. For example, subgroup member and core attendee of SLPN meetings, P1, described a similar list of requirements for a project/study of this type based on her experience. This included training, manager support, time, positive collaborative attitude, agreed outcome, leadership (coordination) and a realistic and flexible time scale.

...regards to the technical side of things definitely people would need to have some sort of training before they actually went ahead. ...support from the managers because you will need some time out to do a project like this. And it definitely needs to be collaborative, you couldn't do a project like this on your own. ...group of people would definitely all need to be working towards the same outcome and... positive attitude. ...you need somebody, like yourself, who is out on the boundary if you like to help coordinate it. ...so that it keeps going. ...a time scale ... If we didn't have that I think it would have kind of rambled along ...realistic and obviously a bit flexible.

P1/int/65/05.08.2014

In summary, the learning gained was related to chosen level of engagement and meaningful participation, and could be wider than the immediate procedural and subject-specific/clinical knowledge. Counterintuitively, increased availability of videoconferencing equipment for urban clinicians may have improved participation of those who were geographically-remote.

12.5.4.2.2 Motivation and learning.

Interviewees in Cycle 5 described reasons to participate similar to those found in previous cycles. These often centred on being competent in their role through cultivating mutual support and facilitating appropriate use of their services by being able to create accessible education and information for community HCPs. In addition, the success of seeing the pages developing as they learnt new skills created an ongoing intrinsic motivation.

...the more we saw that it was progressing the more we were excited about it and were more keen to get on with it.

P11/int/12/12.08.2014

...that things that we've put on [the OLR] are actually there and that people can see it ...it's also been good that we've been able to look at the other person's pages... we can share things... exciting in a way to actually see that you're part of something which...is going to be really good.

P3/int/178/08.07.2014

For GP subgroup member P3 voluntary inclusive participation was a significant attribute of the study, which was associated with the challenge of learning. The extract below captures the three psychological needs underpinning SDT as a theory of motivation, in that autonomy and relatedness (in terms of inclusivity) are overt, and an orientation to challenging and developing competence is implied, confirming the relationship between motivation and learning for this participant.

The way it's been done, that it was your project but then we were invited to come on board I think has been a good experience. I think it takes you ...out of your comfort zone because the lymphoedema bit is easy but ...how a website works and how you put things on, is not. So I feel it's been good. A bit scary at times but good as well.

P3/int/13/08.07.2014

Not having time to maintain the momentum of the learning was recognised by some participants as affecting the motivation mid-study (e.g. P8 below) and was a concern I noted in the RD, but this improved when results were forthcoming. This reflects the phases described in SLII® (Blanchard 1985) and is recognised as a phenomenon of long-term projects (Kotter 1996) and long-term learning (de Bilde, Vansteenkiste, Lens 2011).

I had gone into the website [recently] and I felt very pleased that we had achieved something that's worthwhile... for the community nurses, for the service and for us as individuals...
When I took on the project I was quite enthusiastic, quite motivated.
...then ...not getting the time or the long gaps in between I thought maybe we had bit off more than we could chew. But now that it's getting near to the end ... I'm pleased that we've achieved it.

P8/int/200and223/12.08.2014

The negative effect on learning of the long gaps between sessions is addressed below in relation to ways of working (d).

Learning as a specific form of motivation, in the present and in the anticipated future, was discerned from the utterances of some interviewees. For example, P1 had described the technical and clinical learning but then was excited about having discovered the range of resources already existing among her peers, which remained as yet unshared.

It was amazing how many things that other people had, resources, that you didn't have...you're sharing much more ideas and potentially different ways of working, maybe using things in different ways. I think it's all really quite helpful. And that's probably what I would envisage that I would get the most out of the Knowledge Network side of it ...practical stuff.

P1/int/172/05.08.2014

These findings support SDT as an explanatory theory for the motivation shown in this study and that there is a reciprocal relationship with learning. They also confirm that the focal point of an OLR is consistent with the aim within CoP, to share and develop practice.

c) Co-development transforming practice.

The social aspect of the learning and co-development was perceived by P3 as broadening her perspective on the content of the OLR. The shared view was felt to take the content closer to the needs of the end-user and at the same time increased her learning.

...it has worked because you were doing it with quite a few other peopleSo to see things a bit from their point of view as well, and not only from our own, it has helped with that... I think I've learnt more... it definitely looks different from what I had imagined to begin with... You have to keep in mind who you are making it for, that it's not for yourself.

P3/int/20/08.07.2014

The new perspective on the need of the end-user and the emphasis on tailoring the content had also changed P3's preparation for face-to-face teaching, echoing the transformational learning reported by P14 in Cycle 4, and the ability to transfer the learning from one context to the other. The transferability of situated learning to different contexts is debated in the literature (Schunk 2012) but it may be that a change of medium without change of subject enabled transference.

...having gone through it, I would prepare something completely different than I would have done two years ago. Because I've got a better understanding of the kind of things they want to know, and how they would want to have it presented.

P3/int/20/08.07.2014

Similarly, exposure to different media for teaching transformed how P11 considered delivering education and reaffirmed that clinical learning was concurrent.

It's opened new ways for us to get the information that we want out there. We were stuck in a rut of delivering a class-based education programme but ... we're short of time ... if we can do something that's going to help us ... producing a video and putting it on the website, then it's great for us as well. ...more educational services will be delivered this way. And it's good for the people involved in producing it because it upskills them and keeps their knowledge up to date.

P11/int/98/12.08.2014

Not all participants expressed a transformational change regarding the needs of the end-user or how information should be presented, but nevertheless had intentions to adapt teaching practice to adopt the cyclical process of the study. DN subgroup member P8 felt that having trained community nurses over many years she already had a good idea of their educational needs, but described how she would use the OLR to support her teaching, and intended adopting the cyclical process of feedback which she recognised would continue her learning.

No... Because we've been working with community nurses for a good number of years now and we were quite aware of what their needs were and what kind of support that they needed. ...I mean from some of the comments in the feedback that we got, we made a few alterations but there was nothing major.

... we'll get feedback from them when we're running a session and ask them 'any comments? Is it user friendly? Would they refer to it if they had to? How much support has it given?' from that then we can continue to make changes and improve on it.... because we'll both be learning - two way learning.

P8/int/29and213/12.08.2014

The concept of adapting the role of clinical educator to include being an online information steward was a significant aspect of learning for P3. This included the recognition that in Phase 1 of this study GPs had identified certain educational needs, but that knowledge within the speciality was constantly evolving and that it was the LS' role to make that information available to GPs. Therefore, P3 argued, SLPN needed to take ownership of the process.

*...as the lymphoedema specialists ... we would want to give
..information ... the educational needs that the study found at that
 time [Phase 1] ...we've based the website on that but ...now things
have moved on a bit...we are probably the ones who are most on top of
anything new that would be happening within lymphoedema. Then it's
 ... filtering out what is relevant for GPs and ...district nurses... So we
 [SLPN] need to take some form of ownership and keep going with it.*

P3/int/87/08.07.2014

The need for an OLR to function as an information hub of stewarded material was reinforced for P3 by her own search for information on generalist websites; while for P8 it was more about the trust, the HCP could have in the provenance of the information.

*And you can actually see how difficult it can be to get the information
 you're really looking for depending on what search words you use.
 Then you see that it makes sense that you have to one website which
 ...has done that for you*

P3/int/194/08.07.2014

*...if they go onto our website they know it's to do with their clinical
 practice, and they will also know where the information has come
from.*

P8/int/141/12.08.2014

The impact of the study on the behaviour of her peers exceeded expectation for P6. She identified that the process of OLR development had stimulated collaborative critical reflection on practice in the LS subgroup, in a similar way to that reported by P11 in the DN subgroup in Cycle 3.

*...made us think a lot more about what resources we used... [as a] peer
 group trying to think 'well what do we look up?' 'Where do we access
things'... I hadn't thought that would have happened. When we first
 started it was all about 'how do you do this?', rather than the content
 and where I would get that from, so that's been interesting.*

P6/int/14/21.08.14

In addition, P6 reported that increased critical reflection extended to teaching practice. The consideration of, and increased confidence with, combining video and online technology broadened teaching options.

...[thinking] how else can we get that information out to people... it will make us more confident in using different technology... for the girls who did the videos for the other website...it wasn't that onerous to do. ... That's made people think they can do a short clip of something. And probably more powerful than standing talking it through or a PowerPoint of it.

P6/int/307/21.08.14

This was confirmed by P8, who had participated in creation of the video, describing a mental shift to align with changes in the a wider healthcare context towards online information-seeking.

...I would consider it again. ...I would develop other short films for educational purposes... I think it's the best way, ... that's the future and that's the way people have easy access to information ...people have got mobile phones or they've got access to computers. All they need to do is put a word into Google or get a website and the information is obtainable much quicker.

P8/int/130/12.08.2014

The process of subgroups bringing cycles of work back to the larger group was positively reported by all interviewees. Some, like P6, said it was a way of working that they could transfer to other projects in which the group should be engaged.

I think it's worked well as a model. I think we've all worked well in our subgroups and then feeding back to the bigger group and hopefully ...there's lots of projects potentially coming up ...things that we should be doing in lymphoedema that I think that would work well

P6/int/463/21.08.14

These findings suggest that participation in the development of OLR had been a transformational learning experience for those engaged in the process and stimulated greater critical reflection on clinical and teaching practice; it may therefore be a useful form of CPD.

12.5.4.2.3 The learning gained from initial training and the processes of working

An advantage of working with the software of WordPress and Knowledge Network was that it was possible to have a pre-publication (beta) site to learn the technical skills of OLR-building, creating a safe space for individual trial-and-error, guided discovery learning, which could then be discussed in the safety of the subgroup before publication.

For me it was definitely more the trial and error... I was trying to put things on it and [use] all the different widgets... so long as you don't publish anything you can just take it off and so none of us published anything till we met up.

P1/int/192/05.08.2014

The strong preference for face-to-face meetings in the early cycles of the study had been interpreted as being related to lack of confidence and IT skills but P6 added that meeting in a non-clinical environment secured protected time and attention, which was not possible working virtually, as an individual, in the regular clinical workplace. This reflects the working space described by Clement and Vandenberghe (2000) and valued in teacher development (Hall et al 2006); wherein a balance between autonomous working and collective (collegial) working is achieved.

...as clinicians it means that you're focussed just on that. You're not trying to fit it in with everything else that's going on in your clinic. And you've put time aside so it all happens much quicker because we're all helping in putting it on and checking and feeding back instantly rather than waiting till someone else has got time to go back on[-line] to look at it.

P6/int/52/21.08.14

Both subgroups had done some collective initial training with me then worked individually on content, before sharing it, in a simplified jigsaw method of cooperative learning (Aronson 1978). This had been more successful for the GP than the DN subgroup, the latter preferring to work collectively (face-to-face). This may have been due to orientation of individuals but another factor may have been the much greater quantity of interdependent content handled by the DN subgroup, meaning that discrete units of work were harder to distinguish. P3 of the GP subgroup found that the jigsaw-style allowed opportunistic work and flexibility of working time and location.

I've not really blocked an hour off in my diary ...it's more been 'ok a patient has cancelled let's do something with the website while I've got half an hour... also you could prepare something at home... and e-mail the other ones in the group and say 'what do you think?'. So it does work really well.

P3/int/144/08.07.2014

The need for the DN subgroup to work face-to-face became a limiting factor as opportunities to meet collectively were sporadic and made worse by shared clinical caseload, so that sickness and annual leave increased each other's workload. Long gaps between sessions meant that subgroup members found the learning from one session was difficult to carry over to the next, but DN subgroup member P11 described how they helped each other in a peer-tutoring style (Schunk 2012), to make it work.

...we all worked on it together which maybe wasn't the best thing. I had anticipated that we would all take an aspect of it each and go away and do it on our own but it didn't really work out like that and maybe in hindsight maybe the way we've done it is actually been ok. We might not have got as much done but maybe the quality is better. And the other thing is, ...if we left it for any length of time we had forgotten what we had done so each of us were able to remind the rest of the group what we had done.

P11/int/28/12.08.2014

Colleague P8 confirmed the peer-tutoring as a useful co-learning approach in the DN subgroup.

...it was a learning process. Although we're nurse specialists we don't have great IT skills and along the way learning from each other and supporting each other it was good to improve and get to know that technology.

P8/int/98/12.08.2014

In a similar way, the trade-off for P3, for whom the intermittent nature of the work was useful for time management around clinical commitments, was that the piecemeal nature of learning meant that the skills did not become as familiar as she had hoped.

...I probably feel more confident now in dealing with the computer and making the website but still I'm not where I would like to be. that's been a barrier and it is a learning need. ... I don't do it enough ... so that it becomes something that I can just do and I wouldn't have to look it up again.

P3/int/162/08.07.2014

In common with P12 and P15 in Cycle 3, P8, in this last cycle, suggested that a more intensive period of training at the start to grasp the technical skills might have addressed this issue but that freeing time to facilitate this would have been problematic.

...when you did have the time to do it there would be such a gap before you could get back again and then you had forgotten where you were. But in hindsight if you were to develop the website to just take say like two weeks off and just focus solely on that task I think it would have been excellent but not possible.

P8/int/194/12.08.201

An exception to the call for more initial training was P9, who felt that securing ongoing protected time for learning-by-doing would have been more beneficial than a burst of training at the start, which she based on her view of 'how nurses

learn'. It should be noted however that P9 was the participant who, as previously described, had a somewhat imposed peripheral position to her subgroup.

P9: ...the time, because...you can do all the training you want, technical experience, but actually doing it, until you actually need to use it ... it doesn't make any sense.

R: Learning by doing?

P9: Yes...that's how nurses learn.

P9/int/125/18.09.2014

In comparison to the GP and DN subgroups, the LS subgroup had experienced a long delay in getting their initial training through KN but, having received it, they seemed to manage to retain the technical skills, working a mixture of online and face-to-face meetings. As they were working with different software, it was not possible to distinguish whether the retention of skills was a result of the software being more intuitive, the quality of the training or the capabilities of the participants. The pattern of work subsequent to the training was similar to the other subgroups.

Two of us did the training through Knowledge Network ... so after that we got together and worked out how it worked, and then from then a lot of it has been e mail back and forward to get resources to put on, ...And then we met up another twice since then to try and fine tweak it...

P6/int/43/21.08.14.

An interesting observation was made by P6 regarding working on materials virtually, compared to face-to-face. Because of the effort and time involved in asynchronous online discussion, a submission was more likely to be accepted to the OLR without thorough discussion or expanding on to other ideas, hence curtailing the learning opportunity.

...when its online you tend to accept someone sending something and you'll put it on [the OLR] rather than discussing whether that's the most up to date ... when you're all together there will be more discussion about it and more enquiring about what else is out there and it sort of bounces on to other thoughts...

P6/int/66/21.08.14

One of the advantages of having several subgroups working in parallel was that a type of peripheral learning could occur by listening to and observing each other as described by P6.

...things like the technology ... because they got theirs up and running before we'd had our training ... the discussions about hyperlinking and the like. ... when we came to doing ours ...we were able to transfer it over to how we put ours on.

P6/int/137/21.08.14

The difference in purpose of the OLR sections meant that not all learning was transferable. The difference between sections was crudely articulated in earlier cycles as information-giving (GP and DN section), and resource-sharing and support (LS community in KN). By Cycle 5 the design and layout of the OLR sections reflected these differences. The OLR design therefore was an outward projection of the participants' understanding of the end-users' needs.

...the look of it....I think because it's a different type of group going on then the way the pages are laid out suits ... ours [LS subgroup]... you would either ... go into a specific page and be willing to browse through the different areas. For the other subgroups... they had to think very carefully about how could they get that information quickly to someone without them having to read through screeds of stuff and keep it interesting for them as well so that they maybe would go back ...Whereas ours I think is more... discussions and things.

P6/int/70/21.08.14

An advantage of working within the social construct of the wider SLPN group was that work-in-progress was brought to the SLPN meetings for broader discussion.

The social approval of the rest of the SLPN as future end-users of the LS part of the OLR, was particularly important in the latter cycles. P6 describes the enabling effect of the positive social group feedback.

...by that last meeting we'd also had the feedback from the other people from SLPN so that let us pick up on what they'd said. ...and because they were quite happy with that it, let us move on to what else we were going to populate it with.

P6/int/95/21.08.14

The feedback from end-users could also generate reflection on learning and teaching. End-user feedback to the DN subgroup made them reconsider their didactic approach (*spoon-feeding*) to ways of making their pages more interactive for the user; decisions that were based on their tacit understanding of learning rather than formal teacher-training.

P11: ...from the feedback ...we realised that it was a bit like a maze. ...we started off with the idea that we really wanted to put absolutely everything in it but we then, after discussion, decided that's really like spoon feeding people so... [we decided to] make them do a bit of work on their own. ...I think if you have to search for it and do a bit more digging, you tend to remember it more...

P11/int/50/12.08.2014

In discussion with me in their subgroup meetings and in interviews I was able to highlight where theory e.g. interactive vs. didactic might help inform their work. On such occasions the researcher-as-educator role became more obvious.

In summary, the process of short burst of working over a long time period allowed greater flexibility around clinical work but continuity of thought processes for learning was difficult and reduced confidence in technical skills and therein motivation. Working in subgroups allowed some peripheral learning and feedback from the wider social group was affirming to progress, the learning and feedback being motivating. Tacit knowledge was sufficient at times to make practical changes to the OLR but access to education theory, in this case through the researcher, had the potential to create greater learning.

12.5.4.2.4 Theory informing the cycles and the learning

The theory that was brought into the cycles informed the design and became part of the learning from participation in the study. The LS subgroup for example anticipated problems getting people to engage with the discussion forum. In previous cycles we had discussed research into how people use discussion boards and wikis and those who contribute (post) and those who just read without posting (lurkers) and the educational value to both. Subsequent to this many members described themselves as lurkers but then said that if they felt they could answer a question and had something valuable to contribute then they might post a response (e.g. P13 below). Confidence and an appearance of competence seemed to be underlying issues.

I would probably be unlikely to [post anything]...I don't think I would ask but if it was something that I knew was definitely right on how to treat something then I might reply if I could help.

P13/int/212/08.04.14

Using the idea of scaffolding from constructivist theory the LS subgroup decided to create a structure with starter conversations and questions to operate as worked examples for less confident end-users.

...it's almost a confidence thing; to put questions on and share information and discuss. And it's that side of things that we'll need to work on with ours... There are people that ... will always just use it as a resource to go on and look at but there are others that if we can encourage them maybe by starting things ourselves that we'll increase people's confidence to answer a question... we've tried to put some questions up see if we can get some people to.... if we can start discussions then maybe we'll be able to encourage people to answer them. They could also see the way to use it as well.

P6/int/201/21.08.14

I was interested to what extent interviewees were aware of the input of theory. In the findings of previous cycles there seemed to be a minimal reference to theory by participants. P9 observing from the boundaries described the participants'

focus as being on the task rather than on the theory I had brought into the study to support and inform it.

I think they would be more focussed on what they are doing, and not this is why we're doing it ...I don't think it would have been particularly helpful, but also wouldn't have been particularly a hindrance to them to have that.

P9/int/256/18.09.2014

From a more centrally-engaged perspective, P1 (LS subgroup) described being more aware of the action cycles than the research cycles which would seem to corroborate P9's view.

I think sometimes I forgot that we were part of a research process because what we were doing was focusing on producing something usable at the end of it. It wasn't like we were collecting data. I was more aware of the group feeding back to you regarding progress, difficulties and the feedback from you was regarding the end-users and maybe a little about what you were thinking [data interpretation].

P1/int/240/05.08.2014

However, P6 (also of the LS subgroup), could describe the AR process clearly, where the interim findings were described as 'feedback on data' and 'your thoughts' and the theory as my 'reading'. Although the tone is informal the process of evaluating my interpretations of data and theory, and the group having opportunity to evaluate the sense of fit, challenge it, and alter plans as a result, is described.

...at the SLPN, ...we had our reports, we got feedback from yourself about what you'd pulled out the data ...what your thoughts on it were and you were able to link us with some of the reading you'd done. Then that was fed in ...then yes we could challenge how we felt that sat with us. ...so there was an opportunity for us to discuss that and then make a plan, '...Does that lead us on to try and tackle it differently or where are we going over the next quarter?'

P6/int/352/21.08.14

In summary, theory had underpinned every aspect and every decision through the cycles of this study. Explicit vocabulary for different theories was not evident from participants but the ultimate design of the OLR and their chosen way of working was reflective of the theories informally discussed in meetings. I concluded that in practical terms the tacit integration of theory was sufficient for the task because it was contextualised (Eraut 2004); my thoughts as to whether I should have made theories more explicit was reflective of me as an educator rather than as a clinician and group member.

12.5.4.2.5 Impact of the study on the SLPN as an organisation

Until the fifth cycle the only factors to have emerged as barriers inhibiting specialists from using the OLR pages as an online community space were:

- a) their confidence in the skills to participate in discussion forums and
- b) concern over patient photographs in teaching resources.

For P6 two further barriers existed; first, fear of criticism and appearing incompetent, and second, that teaching material, involving investment of time and effort, might be misused by inexperienced practitioners.

...that leap of faith ...even though it's peers, are you sharing with people who are going to criticise? For the discussions it's that feeling of 'well should I know this' and 'if I ask a question when I'm supposed to be a specialist'.... And for sharing resources ... something that I've put effort in, ...who is going to use it and how are they going to use it ... There is still a bit of uncertainty and scepticism about that. ...part of that is tightening up on who is going to be a member and how we're going to, 'police' isn't the right word but how we're going to monitor that... doing these projects has made us think exactly who is our membership...

P6/221/21.08.14

Some of the discussions through the previous cycles expressing concern over the sharing of consented patient photographs may have been masking these two issues. The impact of creating a password-protected area for LS resulted in a

change of the constitution of the SLPN to include clearer criteria of membership so that existing members might be more confident as to who was sharing their teaching resources.

For P8, the OLR itself was seen as changing the balance of responsibility within the SLPN membership since the online existence amounted to creation of partial VCoP (Dubé et al 2006). Within an online community the previous inequity of access and engagement from geographical distance or eligibility to attend meetings would be reduced. P8 saw this increased communication for outer members as an opportunity for them to take greater responsibility for group activities.

...the outer people [those who do not attend SLPN meetings] must also be responsible and not leave it for other people [core members] always to do. Because that's how technology makes that easy, to communicate. So its not just one sided it has to come from both sides or it would be very unfair. ...to take some responsibility too for being part of the group... they're all just members.

P8/int/180/12.08.2014

In a broader sense, the study was seen as challenging the group to work more collaboratively, particularly in the contemporary context where there was opportunity for political influence. P6 put the study in a wider political context.

...it will challenge the group to do, to share and to work more collaboratively. ... that's something that we're not the best at... if we work together as a Scottish group rather than individuals... with all the changes from the Scottish Government paper, you know the SMASAC report coming out, the work ...[we've] been asked to do on that; and that's been Scotland-wide... there's lots of things we could be doing Scotland-wide and I think that needs collaborative working. It challenged the way we ...work as a groupit's just raised awareness of the fact that there's things that we have become set in the way that we do it ... just raising the question 'is there another way to do this, can we work differently?'

P6/int/250and330/21.08.14

In Cycle 4 it was suggested that the collaborative work on the OLR gave some participants an increased sense of belonging and identity as predicted by Wenger (1998). P8 pointed out that there were a number of different projects occurring contemporaneously which may have also contributed.

...because there were so many other things that were bringing the group together like the ILF conference and with the [Macmillan] Project. There were a few things that the group had to communicate more often. So that's why it's difficult to know.

P8/int/157/12.08.2014

In this cycle an increased sense of purpose was also suggested which was enhanced by the timeliness of the study in relation to the contextual political activities. For P3 the advantage of the OLR was that it was an ongoing project where the others were time limited.

... because at the same time as this was the Scottish Government working group and the Macmillan Project and then the website for me ... it's given the group a purpose. I think the website will be good because obviously the other two projects have finished now. ...the website can help to keep the focus and continue to give it more of a purpose. ...there needs to be a reason why we are there and why we have taken time out from work to come. ...the last year and a half because of these projects going on has been really good. Ourselves we are actually more than just a group coming together three times a year but we've actually helped in developing things. So I think it definitely helped to shape the purpose of the group. And I think because the website is an ongoing thing then hopefully that will continue.

P3/int/233/08.07.2014

In summary, reasons for reluctance of some SLPN members to engage with an online community, over and above technical confidence, were suggested which were two competency-related issues: a fear of appearing incompetent though forum discussion and anxiety that teaching resources would be used incompetently. Also in relation to the online community for SLPN, it was proposed

that the OLR had the potential to redistribute responsibility throughout the membership, to include those who could not attend meetings. The study itself was said to have challenged the SLPN to critically reflect on how the group works and to work more collaboratively in light of contextual changes, and that in this regard the co-development of the OLR had given the group an increased sense of purpose.

12.5.4.2.6 Learning from reflecting on the Researcher-as-Leader

The role of the researcher-as-leader was explored in earlier cycles when a number of different descriptors emerged: facilitator, coordinator, guide and other roles. In Cycle 4 this was encompassed in a discussion of types of leadership in relation to the model of OLR development. By Cycle 5 some interviewees had reflected on this role and, based on their experience, offered a retrospective view, and prospective suggestion, as to what the role should be in similar future projects. Similar words emerged again e.g. coordinator, help and guide. Cognisant of the potential limitations of the peer-to-peer interview situation (Coar and Sim 2006) the question of my role was explored indirectly by asking interviewees about their views on the AR method used. For example, I asked about times when the norms of the group were being challenged, such as the lack of critique and whether this should have been challenged. The response from P6 was typical of interviewees in this cycle, there was recognition that a fine balance existed between learning by challenging norms but not so much as to disengage people.

...it's quite difficult to deal with when we are all peers, any sort of criticism ...any negative points. That was quite interesting, watching us as a group, how people sort of responded. ...you could tell people we're a bit uncomfortable at times. ... it would have been very easy to either knock people's confidence ...because it was new to us all or ...disengage them with the project because they'd have felt well 'you know I'm doing the best I can' ...as a group we should be better at being more openly constructive in our criticisms. And whether that's something as coordinator [you] could have ...led more I don't know but there was ...opportunity and ...ground rules ...were well laid out. ...nobody wants to say anything...that can be quite difficult.

The way the leadership role was conducted was strongly influenced by the social group structure and the way it functioned in order to maintain motivation.

In asking about the roles people had adopted and the impact that had on the actions taken, the interviewees also spoke of my role. The non-directive approach I had taken to the leadership was seen by P8 as a function of the researcher position as she saw it, that is, the traditional researcher-as-outsider who would try not to influence the action on their project.

What you were trying to do was not become too involved because it was our project. You were trying to keep back from that but give us a bit of guidance. But you didn't want...to have too much influence...

P8/int/263/12.08.2014

Whilst for P11, from the same subgroup, more of an insider, peer role was described, in that I had been helping within the subgroup providing particular skills and knowledge.

I don't think it would have progressed either as much or as quickly if you hadn't helped out because our knowledge base on how to produce [that] sort of website ... was nil so the way you've handled it I would say has been appropriate ... we'd have gone astray ...if you hadn't helped out as much as you had...with the knowledge and skill that we don't have

P11/int/115/12.08.2014

Whilst guiding and coordinating remained key words used by interviewees to describe the leadership role, other variances seemed to be dependent on individual perceptions based on expectations and specific incidences of interaction. The findings of previous cycles were therefore not contested.

In summary, reviewing the role of the researcher-as-leader confirmed the coordinating, guiding role with members feeling a sense of ownership of the development rather than it being the researcher's project. This would be consistent with the research methodology used and with Adaptive Leadership.

12.5.4.3 Evaluation of action

The aim in the fifth action cycle was to complete the changes to the OLR and the plans for its launch.

12.5.4.3.1 OLR beta version becomes alpha

All subgroups made changes to their OLR pages based on the feedback from the interviewed end-users and from the discussions at SLPN5. The old SLPN website was closed and the OLR we had been working on as a safe space, the beta site, was made alpha (public). The OLR was evaluated by SLPN members and end-users as having a clean, professional look (Figure 12.5-1) and had summaries and links to contemporary best practice guidelines, videos and photographs of practical skills (Figure 12.5-2) and information to give to patients. Although we all recognised that continued improvements would be needed, we agreed it was ready for launch.

Figure 12.5-1 Welcome page SLPN OLR Sept 2014

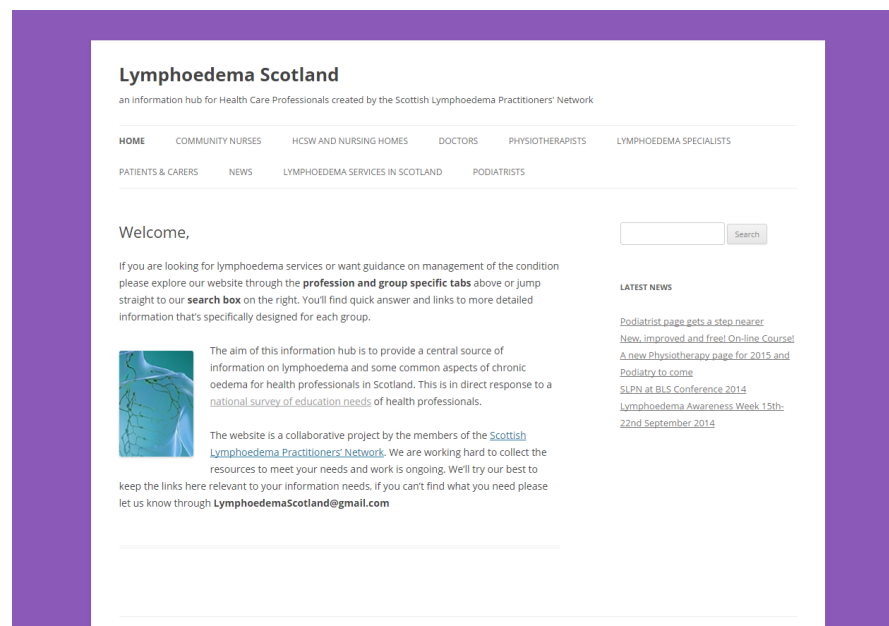
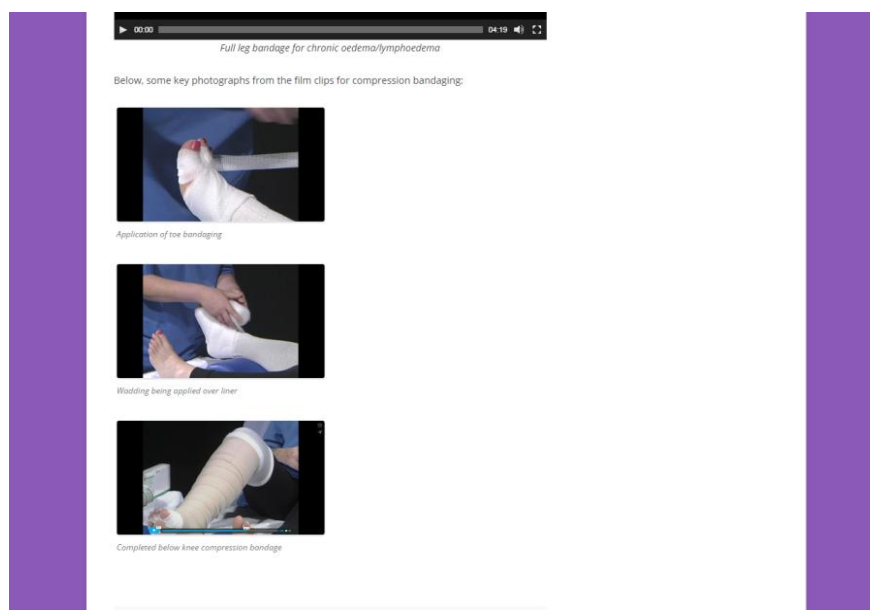


Figure 12.5-2 Videos and pictures on SLPN OLR Sept 2014

The informal feedback in the weeks subsequent to the launch showed that the videos were particularly popular, especially with community nurses and, as well as being used locally, were being used by specialists training community nurses across the UK.

12.5.4.3.2 The OLR launch

The minutes of SLPN5 record that the launch would coincide with BLS Lymphoedema Awareness Week in September 2014 and would include:

Use of intranet in each health board

Staff magazines

Practice managers would disseminate to GPs and Practice Nurses

Community nurse managers

Patients Facebook page

Twitter

BLS newsletter

Having the OLR website address on correspondence or added as a signature on e-mails

SLPN5 minutes, 24.06.2014.

Despite making the outline plan for the launch, tasks had still not been delegated in August (RD 17.08.2014). I reflected that this might have been because of a

change of SLPN chair and secretary in June 2014; the two new officers had not been subgroup members and may not have been so engaged. It emerged in discussions that they had assumed subgroup members would be leading the launch. Meanwhile the subgroups had focussed on finalising the content rather than on notifying stakeholders. The RD records that my thoughts returned to Kotter and his use of champions for change (Kotter 1996). I identified from the transcript of SLPN5 that participant P5 was the most enthusiastic about a public launch. Subsequently P5 led a launch plan and specific tasks were delegated amongst SLPN members (RD 31.08.2014).

The SLPN had taken ownership of the OLR as a group project during the build phase therefore it seemed appropriate that they also collaborated on the launch. I felt that to have led on the launch would have revoked their ownership at a crucial time, and recognised that to do so would have been inconsistent with the recognition of a psychological need for autonomy in SDT (Ryan and Deci 2000) and with the aim of giving the work back to the people in Adaptive Leadership (Heifetz et al 2009).

In September 2014 multiple approaches were taken by members to promote the website:

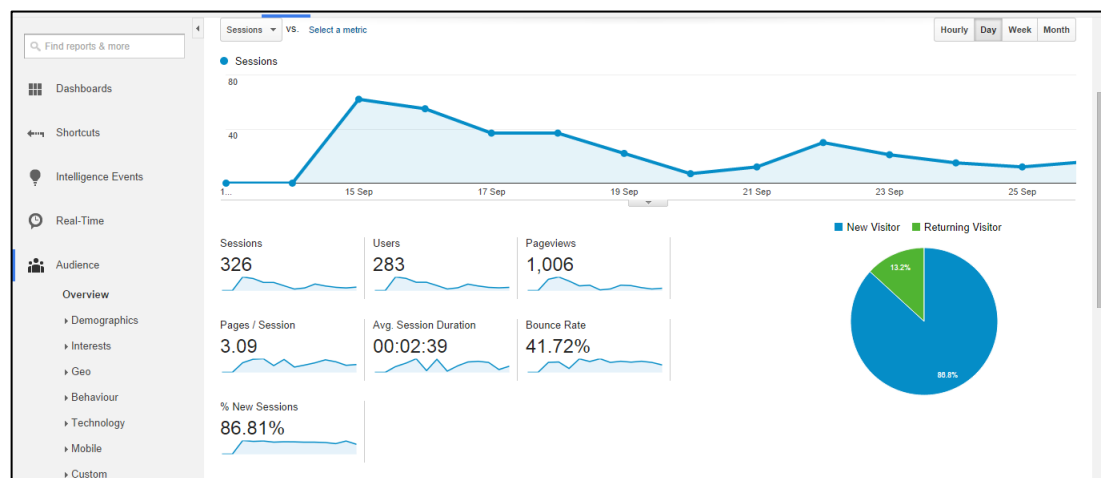
- Articles were written in the newsletters of specialist organisations (British Lymphology Society and Lymphoedema Support Network, the Scottish Cancer Prevention Network and Scottish Partnership for Palliative Care).
- The Primary Care Programme Support Team was informed of the launch by e-mail, linking the OLR to recommendations in the SMASAC report on lymphoedema (Scottish Government 2013a).
- An SLPN member (P1) designed a flyer which was distributed electronically through the NHS intranet (in health boards which gave permission to do so).
- The local university helped by facilitating an article in the press which featured lymphoedema sufferers of different ages.
- Many members took opportunities whilst presenting at medical conferences around that time to promote the OLR.
- Social media such as Facebook and Twitter were used

- OLR details were added to the members' e-mail signatures

The promotion generated some pleasing unsolicited feedback from many different health professionals and organisations, which was overwhelmingly positive, including targeted areas such as Cardiology consultants and Breast Care Nurses. Unfortunate timing with a significant national political event in the same week overwhelmed press coverage to the wider public. However, since the main targets were HCPs our evaluation of the launch was that it had been reasonably successful but we would need to continue promoting the OLR at times of salience to potential end-users.

Our evaluation of the launch was supported by statistical analysis of visitors to the OLR during the launch period, which showed that it had over a thousand page views in a week, from 283 unique users. Almost 87% of these were new visitors, that is, they had not been part of the OLR development or testing (Figure 12.5-3).

Figure 12.5-3 Analytics of OLR visitors in launch week



The average duration of less than 3 minutes was not a concern at this point since these people were assumed to be accessing the OLR to have an idea of what it contained for future reference. The analytics could also tell us what type of organisation some people were accessing from, which countries or even cities, and which servers they used to access the OLR. Continued monitoring of the analytics was built into the sustainability plans and was subsequently useful to monitor activity when we added (and promoted) particular new resources, quizzes or learning modules.

12.5.4.4 **Summary of evaluation of Cycle 5**

In summary, the OLR was completed within the study period to the SLPN members' satisfaction for launch. The group assumed ownership of the OLR as an ongoing project and enthusiasm for ongoing learning remained. An unexpected additional resource in the form of a gift enabled greater security of the online site but did not change the ethos of the OLR in being created and maintained collaboratively by HCP within existing resources.

12.5.5 **Specifying the learning: discussion of Cycle 5.**

The learning gained by participants in this study had an impact at individual and group level. Technical skill was demonstrated and clinical knowledge gains were claimed, as well as greater understanding of the social functioning of the group. In addition, a wider perspective on HCP learning had a transformational effect on the clinical teaching of some participants, from teacher-centred to student-centred. This would imply that, at least for some, there was meaningful activity rather than mere nominal participation (Wenger 1998; Handley et al 2006).

Group level changes included a change of constitution which would change the group's location in CoP typology (Dubé et al 2006; Hara et al 2009); and recognition of the need for greater communication and collective critical reflection on practice, greater political identity and engagement, and modernising of group functioning. The OLR was seen as a means of contributing to achievement of these aims by creating a space for a partial-VCoP, thereby enabling engagement with a wider membership, given clearer membership criteria. Managerial support for participation in the study was almost universal, where described, with recognition of the Continuous Professional Development benefits of staff having increased opportunity to work and learn from a wider range of professionals, as well as satisfying a desire for clinical specialists to be involved in research.

Different styles of learning approach were reported and observed, which included individual self-directed learning, a jigsaw-style collaborative learning (Aronson 1978)(section 12.5.4.2.3), peer tutoring, group work, discursive critical reflection

on clinical and teaching practice, and peripheral learning. Each learning approach had a social component, since even the self-directed learning started from a group/subgroup discussion and was taken back to the group afterwards. The OLR is a reification of the socially-situated learning of the group and as such is consistent with the conceptual framework proposed in the model in Cycle 4 of the group as a CoP (Wenger 1998). CLT however gave an added dimension that helped explain the slow start to the project, and impacted the type of leadership most likely to be effective.

Social norms of the group were confirmed to include autonomy of individuals, a respect for each other's experience and competence, and a sense of identity as a group of specialists within a defined domain. Learning was motivated by the need to maintain autonomy, competence and relatedness-to-the-group as well as relatedness to the needs of a particular patient group. The learning in turn influenced the CoP, by raising critical awareness of group functioning which was said to have become somewhat stagnant at the pre-study stage.

The order of influence in the model was therefore confirmed, where the arrow (→) symbolises influence:

Motivation (need for autonomy, competence, relatedness) → Learning → CoP

The social norms of the group influenced the need for ongoing flexibility of leadership appropriate for the study. This is consistent with an Adaptive Leadership (AL) style, where an overall direction of change is the aim but the process remains responsive to participant need. In addition, familiarity with SLII® tenets adapts leadership to the competency and commitment of individuals. Despite reflections in earlier cycles that my leadership should have been more directive i.e. giving specific tasks, this was not supported in the findings, and would have been inconsistent with the participants' need for autonomy. Educational support (guiding, helping, and coordinating) was more appropriate for this group. Autonomy supportive, modified AL was shown to be appropriate for the psychological needs underpinning the motivation of this group; appropriate leadership influenced motivation. Leadership in turn would be influenced by the learning and competency of the participants, that is, as competency increased

more autonomy was taken. Confirmed therefore were the order of influences in the model:

learning + competency → leadership → motivation

Progress in OLR development was associated more with the reciprocal relationship (← →) between learning and motivation, than to leadership. Also confirmed in this cycle therefore was:

leadership → motivation ← → learning + competency → OLR development

This final AR cycle extended the model, in clarifying the effect of the social group's practices on leadership. In the model a new line of influence is therefore added from CoP to leadership.

CoP → leadership

The new model therefore becomes as depicted in Figure 12.5-4.

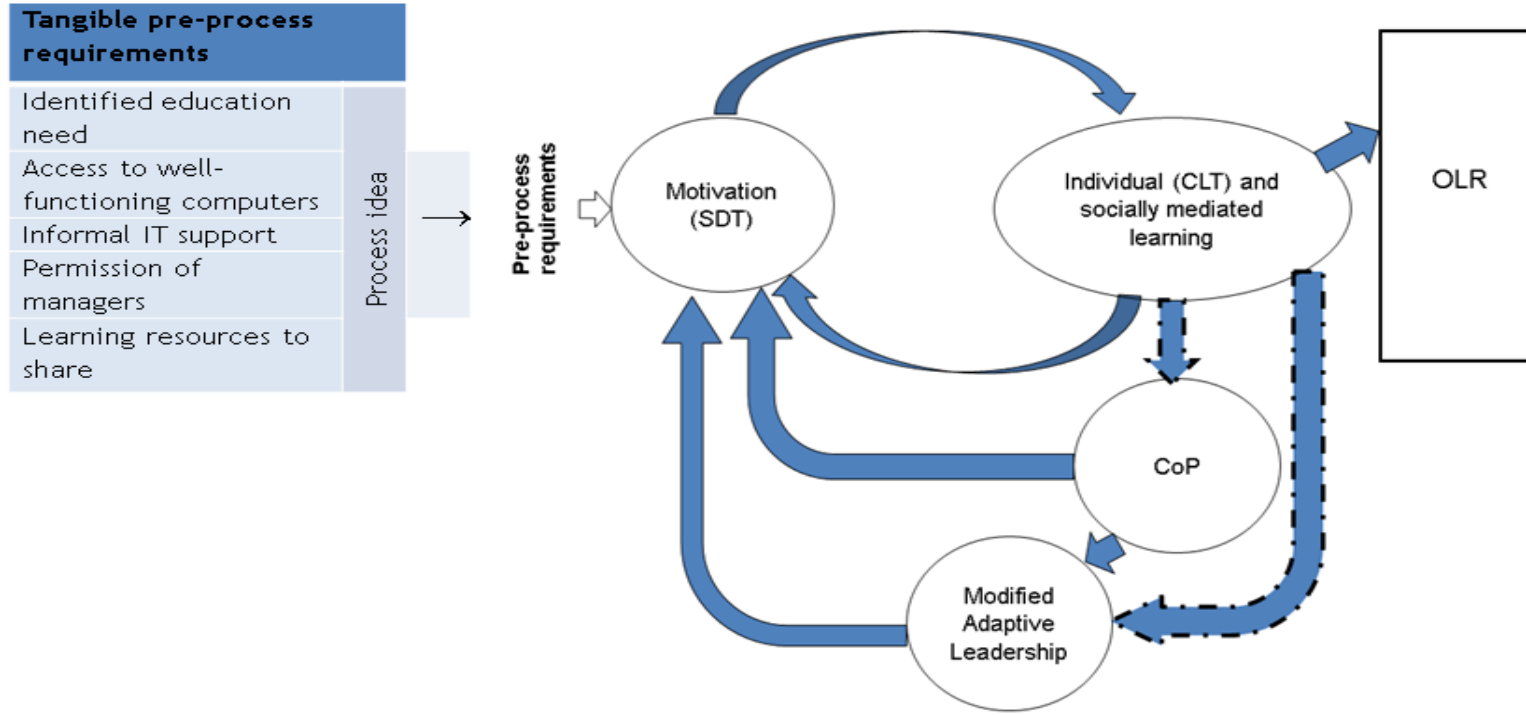
12.5.5.1 Summary of findings and questions emerging from Cycle 5

In summary, the final cycle of AR further developed the model of OLR development by HCP by the addition of a relationship between the CoP as a social construct and the leadership component. Other components of the model and their relationships were confirmed. The OLR was developed to the satisfaction of the SLPN and end-users within the given timeframe and is considered an ongoing initiative.

The learning for participants of the study was positioned at two different levels, individual and group, which included changes which transformed teaching practice and the way the SLPN functioned. The long-term effect of such changes was beyond the life-span of this study but if critical reflection on and within the group continued then sustainability through ongoing adaptation to changing contextual and political pressure would seem more likely. This would satisfy the third order organisational change achieved through AR described by Coghlan and Rashford (2006).

The wider learning from the study will now be discussed.

Figure 12.5-4 Model of OLR development



13 DISCUSSION

13.1 Introduction

This doctoral thesis was presented in two distinct phases. The first phase confirmed that HCP had lymphoedema-related educational needs, and provided new insight in relation to the nature of these, and how they might be met. The findings of Phase 1 were then used in the second phase, with my peers at the SLPN, as the basis for collaborative cycles of work with the aim of producing a lymphoedema-related OLR; the research aim being to model the process of development of an OLR by HCPs, within the existing infrastructure. Previous collaborative projects in healthcare have focussed predominantly on the quality and usability of the resources produced (websites, CWA, blogs); and whilst some claimed learning by participants, there was little research of the processes involved and what could be learnt by exploring that process itself. This thesis has found that collaborative projects by HCPs to develop OLR, based on the model developed (Figure 12.5-4), and using a critically reflexive AR approach, provide opportunity for sustainable theory-based service development in healthcare, within existing infrastructures. Further, participants may experience learning that is not just project-specific, but learning which may transform practice. It is suggested that the addition of learning theory to recent discourses on 'new leadership' in healthcare has potential for greater sustainability and impact which deserves further research attention. In this chapter these interpretations are presented as a synthesis in relation to relevant empirical and theoretical literature.

13.2 A reflection on what the action research approach added.

Core to the process modelled in Phase 2 was the AR approach taken, therefore it is appropriate to first reflect on what this approach added to the study. Chapter 10 highlighted that there is a whole family of approaches under the umbrella of AR but that core criteria exist (Cohen et al 2011). Aligning the research questions, personal epistemology and sense of fit to the SLPN group gave a starting point. Drawing on information services and management literature I based our provisional programme manual (Appendix 19) on an understanding of AR as dual

cycles (McKay and Marshall 2001; Chiasson et al 2008), and we monitored our fidelity to the process against post-positivist AR criteria (Davison et al 2004). The similarity of the action cycles to audit cycles, already familiar to participants, was an advantage. The fact that the process itself was the focus of study as opposed to the practice of individuals (as in practitioner inquiry), seemed less threatening to my peers and may have contributed to their willingness to participate. However, acknowledging that the process needed to remain responsive to ongoing findings meant that the programme and criteria lists were considered guiding documents only. That is, fidelity tools were used as learning and discussion tools. Subtle changes which may have been missed, such as increased number of participants in each subgroup, were captured as variances and the reasons for these were explored with the participants. Since my peers were relative novices at both research and OLR development, the provisional structure offered by these tools was consistent with the scaffolding of learning suggested in later findings. Further, the dialectic process of evaluating the findings of each cycle provided a useful learning opportunity, with some participants in the well-established group recognising a need to nurture critical reflection-on-practice, hence dialectic analysis was a strength of the study.

The use of AR as an approach enabled a progressive process within which themes would emerge in one research cycle then wax and wane through subsequent cycles. Notwithstanding previous representations of the AR process in the literature (discussed in section 10.2.2), I found myself mapping themes as they arose from cycles into visual representations (e.g. Figure 12.0-1). These were useful in discussions of my developing understanding with SLPN participants and academic supervisors. This, and the tools used in relation to fidelity to the AR process (section 11.4.4) were valuable as my stance evolved through the study. These factors enhanced the rigour of the study.

The timespan of the study was both a limitation and strength. As noted in the findings, the long gaps between episodes of work meant that some people found it difficult to carry over their learning from one session to the next, and consequently required re-familiarisation with the software every time. Given additional resources, such as time for training and implementation, the whole process of OLR development may have been quicker. However, the spread of work over several months allowed time for critical reflection on norms and practices,

and the flexibility to fit tasks around weekly work duties. This reduced the impact on resource requirement and increased the sense of learning and ownership which would engender sustainability.

13.3 The findings in relation to the research questions and what was previously known

The first phase extended the previously-existing knowledge, reviewed in chapter 2, regarding lymphoedema-related educational need among HCPs in Scotland. Notwithstanding the acknowledged limitation around survey distribution, the first phase found that HCPs had profession and context-specific lymphoedema-related educational needs. The use of focus group discussions subsequent to the surveys increased understanding of that educational need when HCPs were dealing with patients with lymphoedema/chronic oedema. What was known was that despite patients increasingly using the internet for health information they still expect their local HCPs to be able to inform, support and refer to specialist services appropriately. Phase 1 confirmed a lymphoedema-related educational need in HCP which would affect their ability to support patients in this way. Further, an educational need was found in the LS who support the generalists and who deal with the complex cases of lymphoedema/chronic oedema. Both the surveys and focus group discussions showed that HCPs believed their educational needs could be met by a number of means, including OLRs supporting more traditional models of face-to-face contact.

The research aim of phase 2 was to model the process of OLR development by the SLPN. Consistent with the AR approach, research questions were allowed to emerge from the findings iteratively. Therefore at the outset, cycles were based on practical questions: ‘what have we got, how might we use it, what helps and hinders, what will we learn, what might others learn?’

In exploring the existing expertise and resources, and how these might be utilised to develop an OLR, I had approached Cycle 1 with a project management lens. The use of the Logic Model for framework analysis of qualitative data, although consistent with the research question and paradigm, reflected this lens. In this first cycle we looked at our existing resources as inputs to a process. From the

framework analysis, SLPN participants' assumptions regarding existing resources and tacit managerial support were largely confirmed but some potential barriers were identified. Unexpected in terms of input, was the willingness of the participants, given their perceived workload pressures. I recognised this to be a particularly interesting finding which would be significant to the whole process. I perceived a limitation of the framework analysis to be that it could identify the willingness as an input, but other forms of analysis might be more useful for interpreting the motivation behind it. An advantage of the AR approach was that the method of data analysis could be adapted to suit emerging research questions.

Similarly, the different types of SLPN subgroups (localised/dispersed) meant that questions might arise from their differing approaches to problem-solving. The cycles of action and reflection proved useful, not only to question the rationale of actions, but also to consider any differences that might arise from having predominantly self-report data from one subgroup (DN), compared to having additional data from observation of e-mails from others (LS and GP). Being able to involve the participants in the evaluation of my interpretations gave increased trustworthiness.

Involvement of my SLPN peers as participants in evaluation of action cycles, and interpretation of data, relied on them feeling able to critique. Reflection on an apparent reluctance to challenge my interpretations in the first cycle prompted consideration of the researcher role and the effect of group structure and norms. This raised a more open research question for Cycle 2, regarding social structure, and therefore thematic analysis of the data proved more useful than framework analysis. The opportunity to reflect on and change the data analysis method iteratively, as befitted the research questions of each cycle, was a strength of the study.

In addition, the expectation within AR to be reflexive, helped me to identify at an early stage an unspoken political intent on my part to increase online communication within the group and increase SLPN profile in response to the contemporary contextual political changes described in chapter 1. Implicit within AR is that the researcher acts as change agent, creating positive dissonance for individual practitioner inquiry (Baumfield 2006), but they should guard against manipulation and coercion, and conflicts of values and goals (Coghlan and Shani

2005). Dillon (2014) warns that power differences can be subtle and complex, but recognition of this at an early stage enabled me to be mindful and to explore this with the participants.

Cycle 2 in turn identified indicators of CoP as the primary social structure of the group. Emergent themes could relate to individuals or the group, recognising the separateness but inter-relatedness of such themes; analysing these concurrently acknowledged that social structures can enable or constrain human agency, and that human agency produces and reforms social structure (Bhaskar 1989; Archer 1995). This was consistent with the post-positivist stance described during phase 1, despite the methodological move to more interpretive, insider research in the second phase. This latter perspective made it entirely appropriate to consider group changes (the way the group functions) in relation to, but separate to, individual learning and motivation. Consistent with this argument therefore was the consideration of both Cognitive Load Theory and Situational Learning from the evaluation of the second cycle, since both these theories describe individual learning which is enabled or constrained by the social context. A limitation in the scope of the study was that whilst the social structure of the group could be studied, the broader social context of the various places of work of individuals could only be inferred from self-report data and from the researcher's own experience.

In this thesis I drew on the work of Lave and Wenger (1991) in terms of the conceptual framework of CoP, but in particular Wenger (1998) and Wenger et al (2002). Conceptualising the OLR development as Wenger's notion of a group enterprise and of the OLR as an object of negotiated meaning prompted consideration of identity and relatedness which generated deliberations on how this related to the constructs of autonomy and relatedness described by Ryan and Deci in Self-Determination Theory (SDT). In addition, Wenger's (1998) description of levels of participation and learning as being chosen by participants e.g. boundary workers (later elaborated by Handley et al 2006), was useful when interviewing participants. That is, whether level of participation was a choice which depended on sense of coherence with the group (belonging/relatedness), competence (skills and knowledge), and/or motivation; factors which brought together constructs from learning theories and SDT, and would impact leadership.

Part of the social situation in the specific context of this study was the role the researcher played, or more significantly, how it was perceived by the participants. The aspects of my role that seemed to enable or constrain became the focus of the subsequent cycle. In recognising that in question were the factors that affected individual human agency, the principal sources of data in Cycles 3-5 were individual interviews supported by meeting transcripts.

In Cycle 3 facilitators and barriers were identified to be across individual participant themes (motivation, skills and knowledge) and social structure themes (the process of the research, the role of the researcher, and social group practices and norms).

The barriers identified in this doctoral study supported the findings of Archambault et al (2013) in their large scoping review of collaborative writing applications (CWA) in health care, but extended this knowledge by suggesting possible explanatory theories. Specifically, Cycle 3 findings in relation to motivation, confirmed in subsequent cycles, were consistent with SDT (Ryan and Deci 2000).

Based on the work of Ryan and Deci I argued in this thesis that consideration of the motivation of HCPs is central to finding solutions to local problems when resources, such as time and extra funding, are constrained. Ryan and Deci's claim of an essential need for autonomy, competence and relatedness was especially useful to my analysis as it allowed me to think through the actions taken and the factors that participants described as facilitators and barriers.

To this end, Ryan and Deci's conceptualisation of competency (which they described as self-efficacy) was generative for grasping how an understanding of learning theory would have a reciprocal effect on the motivation of participants. Related to this was their conceptualisation of autonomy and the role that I played as leader/facilitator/co-participant. This led to analysis of the type of leadership appropriate to the situation. It is here also that Ryan and Deci's attention to relatedness was of value for informing the exploration of social structure of the SLPN group, and the way participants related to their patient group and organisations.

Withholding judgement mid-study on the type of learning proved useful. The extant learning theory might have been assumed to be Situated Learning in describing the group as a CoP but findings were not entirely consistent with this. Some findings were more akin to constructivist and socio-constructivist learning as described by Bruner (1966) and Vygotsky (1978), and others with Cognitive Load Theory (Sweller 1988).

Managers (leaders) play an important role in workplace learning (Eraut 2010). The fourth cycle therefore sought to explore further the relationship between the identified themes as possible components of a model and in particular the interplay of the researcher role. Here Heifetz's (1994), theory of Adaptive Leadership provided the best fit with the data and perception of the group. Heifetz's conceptualisation of problems as technical or adaptive was especially useful to my analysis as it allowed me to consider the adaption that SLPN members were having to make, not only in how they provided educational opportunities to generalist HCPs but in satisfying their own learning needs. However, data in relation to the role I had played indicated that greater consideration of the skills and knowledge levels of the participants would have enabled a more effective leadership. Although Heifetz acknowledges a need for the leader to be sensitive to the needs of the followers here Adaptive Leadership is less specific. The addition of aspects of Blanchard's (1985) Situational Leadership II was more prescriptive in terms of how leadership should change as participants' competence and commitment changed. Future empirical research on Complex Adaptive Leadership (Obolensky 2014), a development of Heifetz' work incorporating complexity theory, may inform future versions of the model of OLR development proposed in this thesis.

In the final cycle the aim was to explore the learning and test the draft model developed in the Cycle 4. The interpretation of constructs from several different learning theories was consistent with the multiplicity of learning theories currently underpinning medical education (Mann 2011). However, particularly interesting was the perspective added by considering CLT. In relation to the early cycles of this study, participants were processing a great deal of new information from an entirely different domain to their usual clinical expertise. Sweller (1988) argued that in such a context participants would be novices who would not have existing schema to incorporate the multiple interacting elements of the complex

task, creating a high intrinsic cognitive load. This led to the recognition that the type of leadership should have initially been more supportive and educational, rather than more directive. So although the novelty of the situation would create some motivation to learn, overlapping with SDT, it also changed status and relationships within the social structure. CLT was therefore of value in informing the model so that a final relationship between the CoP as social construct and the leadership style was described.

Underpinning all cycles was a waxing and waning perception of time as a constraint. A finding of this doctoral study was that this was related to sense of competence, and which may be explained by the extra cognitive work required as described in CLT. The underlying context of the working lives of the HCP participants of this study was of burgeoning workload and increasingly divergent responsibilities as reflected in both the Rose Report (Rose 2015) and NHS Scotland Leadership Qualities Framework (NHS Scotland 2014). This was captured in some interviews but was largely set aside as a common assumption for all participants. In the vocabulary of CLT, the intrinsic cognitive load is high because HCPs are taking on new tasks, the extrinsic load in many clinical spaces is large with multiple distractions and there is little time for the germane load to create the networks and schema which would change the short term memory into longer term memory (maximising the learning from the situation). Future studies of cognitive load on HCP in the workplace and whether these can be mediated with a better understanding of CLT is recommended. An extension of this would be whether there is a corresponding increase in motivational scores. This would be an interesting area for further research.

The deliberate development of CoP in organisations for knowledge management was an area of existing literature, with equivocal results. What this study adds is the need to recognise that different types of learning theory are pertinent to the contemporary context of resource constraint in healthcare service development and therefore it may be time to revisit the usefulness of CoP. Furthermore, what shapes learning depends as much on how people interpret and construct meaning from their experiences, as from the social setting or what learning was intended (Billett 2009).

13.4 Reflections on the relationship between Phase 1 and Phase 2

Reflecting on the relationship between Phase 1 and Phase 2 I could recognise that during the period of the individual conduct of phase 1, unlike my peers on the SLPN, I had time to consider an ethical obligation to address an educational need if one was identified, and how this might be addressed. The transition between the phases of this study was a period of almost a year in which, not only were the practicalities of addressing an identified educational need addressed, but there was time for reflection on what adaptation of teaching approach might look like for us as specialists. When presenting the results of Phase 1 to my peers we had acknowledged that I alone could not address the identified educational need, but that it required a collaborative approach. Initially exploring existing models of service (e.g. remote telehealth consultation) we were already starting to think how current skills and knowledge could be delivered in a different way, that is, we were contemplating adaptation. This would correspond to the contemplation phase of the trans-theoretical model (TTM) (Prochaska, et al, 1992). When use of existing models were not possible due to resource constraints, we worked together to develop the Programme Manual for Phase 2, which represented their active participation in a new intended behaviour. It also gave time for me as a researcher to explore my positioning as discussed in sections 10.1.1 and 10.3.1. This was an interesting point of personal learning and prompted in depth exploration of my personal epistemology which is reflected throughout this study. From a practical perspective, the transition from Phase 1 to Phase 2 also represented a shift from a reliance on external stakeholder funding to acceptance of the asset-based management context.

13.5 Success of the study as a service development

The OLR was developed to the satisfaction of the SLPN and end-users within the given timeframe and remains an ongoing initiative. The literature search at the start of the second phase of this study identified that there was a dearth of good quality research aimed at understanding the process of development of OLR by clinicians, particularly where resources are tightly constrained. In excluding learning resources developed for students in academic institutions and those which had significant financial and technical support it was perhaps not surprising

that only a limited number of studies remained. In specialist topics, where the impact of education is aimed at Long Term Condition (LTC) management, the opportunities for additional funding for new initiatives are sparse. The lack of additional time for training and resource development, and lack of professional technical support were likely to have significant effect on how the process was managed, but was felt to be more in keeping with the reality of contemporary health care. The literature identified focussed largely on the satisfaction of users in the final product (website/OLR) rather than the components of a process that made such developments achievable and sustainable e.g. Street et al (2007), Welsh and Houston (2010). The production of OLR or information hubs by clinicians is not unique, what *is* unique is that by working collaboratively and iteratively through critically reflective AR, this was possible without significant additional resources, and without formal training in IT skills or pedagogy.

13.6 Within existing infrastructure?

Wenger described CoP as self-organising by nature and therefore having fairly modest organisational needs (Wenger 1998). In concluding, Archambault et al (2013) claimed that CWA had potential to improve implementation of evidence-based-practice at remarkably low cost. Yet, a noteworthy finding in the review of literature for this doctoral study was a lack of sustainability without significant additional resources. Key therefore to the success of our study was that the approach would engender ownership of the OLR as an ongoing output of the study. Modelling the process enabled an understanding of the facilitators and barriers, such that, even though they echoed those of Archambault et al (2013), they were largely overcome so that the OLR remains sustained.

As outlined in this thesis there are many types of group, CoP, professional networks and others, but what the modelling process highlighted was that identifying the characteristic social practices of the group was more important than a designated label. Archambault et al (2013) stated that understanding the success of a project using a CWA must also include exploring the fundamental elements of CoP. Extending these works, this doctoral study suggests that an understanding of the social group practices and the level of competencies and commitment of individuals at any given time should affect the type of leadership required. Furthermore, appropriate leadership could emerge from within the

group by taking a critically reflective approach. The study findings would not however preclude that, given sufficient understanding of the context (i.e. all the components of the model) a temporary external leader might successfully facilitate such a project; assuming an extant aim of handing the work back to the people to ensure long-term sustainability.

In this study, my time as researcher might have been seen as an additional resource to the existing infrastructure. However, in practice, my role was predominantly on the research cycles, to construct the model from collection and analysis of data. The participants managed most of the action cycles, including evaluation, by re-allocation of existing time set aside for education or service development. The extra resources required therefore to implement a service development using this model might be minimal.

13.7 Reflexivity: the model as reification

The study aim of modelling the process of OLR development was achieved with the creation of a conceptual framework which brought together several theories from different domains. The domains of organisational development (leadership, knowledge management and project management), psychology and motivation, education (learning theory and instructional design), and social group studies were explored for their interplay within the study context. To the reader more familiar with models in a mathematical sense, a model might seem antithetical to my epistemology as it moved along a continuum from post-positivism toward relativity in this study. But I propose that the development of a model of OLR development is a reification of my personal epistemology in the sense that the model firstly assumes intransitive and transitive factors, or, in terms of asset-based management, tangible and intangible (or at least more-easily and less-easily costed or measured). Consistent with the initial post-positivist stance there was recognition of tangible pre-process requirements, or practical components that would need to be in place to drive and enable the enterprise. These may be common to other groups in different contexts, but the factors that overcome barriers and facilitate progress to take place are the inter-relation of many social and individual factors. The details of these would be contextually bound to the people, place and history but there would be general principles which may be useful to other similar professional group projects. The crucial underlying

assumption is that the model should be applied with a critically reflective approach and attitude; the learning therein would be at individual and social group level.

Although few HCPs would have awareness of epistemology in a scholarly sense, the use of what they would perceive to be common sense theories would appear as theory-in-practice or theories-in-action, in the way they justified action or evaluated knowledge (Argyris and Schön 1974; Kuhn and Weinstock 2002). Considering the study as a whole I had questioned why we, as LS, had certain stances and on what basis. I had questioned why we thought there was an educational need, whether the generalists felt they had the same educational need as we thought they had, and how we practice as a social group in making decisions. At the same time my perspective was a practical one - that end-users would only seek education if they perceived an educational need.

In positioning myself within this research I initially thought of myself as a practitioner, the same as my peers. I set out to facilitate an opportunity which might give some resolution to a common problem rather than 'teach' my peers. I recognised within my proposal for Phase 2 opportunity for all participants to learn new skills; within which I assumed potential enjoyment and challenge, the latter particularly because of the time constraints of busy clinicians. Reflections through the study however exposed that a natural inclination as the educator was never far away.

My epistemology is reflected in the construct, progress and interpretation of the study, for example, the consistency of the theory of motivation used with the interpretation of social constructivist learning and autonomy supportive leadership. Roth and Weinstock (2013) defined autonomy-supportive as the degree to which someone is perceived by others to be acting in ways which encourage choice, participation in decision-making, and provide rationale, without language or behaviour that is experienced as pressure. The finding that I played a facilitating, guiding role is consistent with autonomy support.

Despite assumptions that personal epistemology should affect teaching (Hofer 2001; Feucht and Bendixen 2010), evidence that it is demonstrable in practice is equivocal, at least in school age children. White (2000) suggested this may be due

to institutional constraints in teaching methods. However, more recent school studies would lend weight to the impact of personal epistemological beliefs on students (Brownlee, Edwards, Berthelsen et al 2011; Roth and Weinstock 2013) and may reflect a change to expectations of classroom practices. The impact of the epistemology of leaders in the workplace seems not to be articulated in the same way, despite Eraut (2010) advocating the key roles managers can play in learning. Recent discourses on more democratic and empowering forms of leadership, and its relationship to the exponential growth in complexity of the work environment, may reflect much of the discourse in education regarding the use of more relativist forms of teaching.

13.8 My learning

The use of multiple methods of data gathering and analysis in this doctoral study was a particular strength in terms of a research training opportunity. These included being given the time to explore qualitative methods in some depth, the opportunity to work alongside experienced researchers, and the chance to develop skills with research tools such as SSPS and NVivo, Reference Manager and Endnote to name but a few.

The presentation of this thesis as a chronological account was a conscious decision in order to represent my learning as researcher throughout the process. Reflecting on the first phase, I concluded that it was fit for purpose in terms of addressing the research question of that phase but I could identify the bias of a clinician and student researcher in the wording and presentation of some questions, despite the use of steering committees and expert review during the design phase. Inevitably there are questions in the surveys (appendices 3 and 4) which would have been asked differently had we known how Phase 2 would develop and the technological options that would be available only 2 years later but chose to leave Phase 1 as it was in 2012 to maintain the veracity of what informed us going into Phase 2. In so doing, I aimed to take the reader on my learning journey through the thesis, showing that learning can be at times as uncomfortable as it is rewarding.

From a personal perspective the conceptual shift as the study progressed to being inside the study and writing in first person helped deconstruct the initial manager/service development stance (e.g. the use of the Logic Model) to

recognition of myself as researcher, democratic problem-solver and learning facilitator. In addition, I increasingly recognised that I was a social learner, in that as I discovered new concepts and developed ideas I wanted to discuss them with others rather than develop ideas as a solitary exercise. However, the discipline of developing an idea before presenting it proved useful to my learning.

There were many occasions during the conduct of the study when my learning was enhanced by finding the vocabulary to articulate tacit knowledge, such as when exploring the possible connection between the novel task and perception of time, which led to evaluation of the relevance of Cognitive Load Theory. On other occasions I was being challenged to consider this doctoral thesis from a different perspective and to articulate this to experienced researchers or practitioners e.g. the Values and Virtues conference 2015. This involved considering my study from the perspective of virtuous research in terms of the assumptions behind the study, and articulating my values and the conduct of the study. The recurrent reinterpretation of cycles through time, as further cycles were reported, rewritten in themes and subsequently in the final form of the thesis was a form of evolving hermeneutic (Dugger 2003; Hall et al 2000). Developing my vocabulary and understanding of different domains enabled me to articulate ideas which could be very affirming and gave a sense of being able to validate the things that the study participants, my peers and I, were describing.

13.9 Implications for Practice

Action research (AR) is said to be limited in the capacity to produce a wider knowledge by being contextually bound. In this study the details of what was produced in terms of OLR content, and the need it addressed, were clearly context-bound but, by modelling the process, there is potential transferability. Case (2012) warned against over-generalising with models yet their usefulness is not only in the symbolic depiction of a contextualised process but in the transferability through the interpretation of the reader. Transferability of the model assumes that reapplication is done in a considered and critically reflective way. The transferability of the model is in the recognition that each component needs consideration and exploration of agreed meaning within a given context so that the influence of components on each other can be better understood. In planning projects, the model may inform deliberation of the type of leadership

required to maximise the benefit and sustainability achieved from scant resources.

What this study adds to the body of knowledge regarding education of professionals within the work context is that given an iterative process framework, such as AR, critical reflection on both education and clinical practice can be facilitated. Contemporary NHS literature has only recently caught up with organisational literature in recognising that the complexity of the work context in the 21st century needs a new type of leadership. Generally, it is moving away from the old command and control model, (although this is still reflected in the tone of the Rose Report in relation to NHS England (Rose 2015), to a more horizontal-type leadership incorporating ground-up innovative approaches (Bevan and Fairman 2014; NHS Scotland 2014). There is however a notable difference between the leader(ship) development approach in England and Scotland (Edmonstone 2015). NHS Scotland's approach is pluralistic, context-based leadership-development and stands in contrast to NHS England's investment in individual leader-development. This doctoral study aligns well with the pluralistic leadership approach within which the study was situated.

Essential to pluralistic approaches to service development is the willingness and commitment of the people involved in providing services, therefore maintaining a reciprocal relationship between motivation and learning is vital. Maintaining motivation in HCPs is a challenge when there are rapid and ongoing changes and perceptions of lack of control due to restrictive resources (Johnson, Wood, Paul, et al 2010; Scottish Government 2013b). The reciprocal loop of learning and motivation may seem overtaken by overwhelming tasks and deadlines. The latest NHS-related literature reiterates the need for effective use of new technology and a new style of leadership to mitigate the pressure (Bevan and Fairman 2014) but there seems little consideration of what education theory might add. Education theory (including learning theories) seems restricted to discussions of undergraduate training, educating patients or the use of CoP for knowledge management. I suggest that consideration of the possible application of CLT to the busy clinical workplace, as well as the recent greater acceptance of social media as learning tools may provide opportunity to reignite the reciprocal loop of learning and motivation. Further research is warranted on the application of a

combination of CLT and social media as learning platforms in the healthcare workplace.

In health care literature, particularly nursing, there is very little use made of SDT as a theory of motivation compared with Bandura's theories (1977;1986;1991); although recent emphasis of promoting patient self-care may bring renewed interest in autonomy-supportive practice (Phillippe and Vallerand 2008; Kayser, Cossette, Alderson 2014). A key question to take to future research is the appropriateness of SDT as a theory of motivation for other HCPs and other public service professionals. For our study population the underpinning psychological need for autonomy, competency and relatedness was agreed as meaningful and a non-unitary conceptualisation of motivation was useful in understanding behaviour given the particular group norms and history. Other theories such as those of Bandura may be worthy of consideration in a different context given the implicit social learning and similar concept of self-efficacy (Bandura 1977); consideration would then need to include whether the remainder of the model would remain the same.

Underpinning and interwoven throughout the study was the contemporary context of resource constraint and asset-based management. Given that this is the context for public services in the UK the study is likely to have salience beyond the context presented.

13.10 Conclusion and recommendations

The participants of this study (including the researcher) ultimately produced two inter-connected OLR to support lymphoedema-related learning, which continue to be used and evolve. The multiple research methods used were shown to be appropriate to the research questions at each stage and processes to enhance rigour and trustworthiness were made explicit, including the open consideration of ethical issues such as coercion and the role of the researcher.

This doctoral thesis presents a new process model grounded in theory and tested in the context of lymphoedema specialists developing OLR to meet identified educational needs with minimal additional resources. It is recommended that the model be considered for sustainable service development within healthcare. Used

with a critically reflective approach the model offers an asset-based framework in which participants may experience wider transferable, or even transformative learning, as well as project-specific knowledge.

Further, it is suggested that the inclusion of learning theory to recent discourses on 'new leadership' in healthcare has potential for greater sustainability and impact which deserves further research attention. Leaders can emerge from within a group given an understanding of the inter-relationship of influencing theories in a particular context. The model proposed seems compatible with a number of learning approaches giving it a flexibility of potential applications. Practitioners work well with tacit knowledge and working theories but the introduction of the vocabulary to explore influencing theories gives potential for greater learning and motivation, more likely to lead to sustainable and iterative service development.

Further research is recommended in the study of cognitive load on HCP in the workplace and whether or not these can be mediated with a better understanding. An interesting extension of this would be whether or not there is a corresponding increase in motivation for involvement in service or practice development. Related to this, further research is recommended on the application of instructional techniques based on a combination of CLT and social media (as learning platforms) and their application in workplace projects.

To conclude, this doctoral research makes a timely contribution to leadership theory since the resource constraints underpinning much of the contribution has salience to current public services. The process model created has the potential to inform contemporary leadership theory in asset-based management contexts. Further study of a leadership style which incorporates cognisance of Cognitive Load Theory and Self-Determination Theory is suggested. In addition, the detailed reporting of process and how this facilitated learning for participants contributes to workplace education theory.

Glossary

Terms as defined in for Phase 1 (as in Davies 2012)

Oedema	is a symptom of venous with/without lymphatic system failure which manifests as the presence of excessive fluid in or around cells, tissues or serous cavities of the body, causing localised swelling with or without other symptoms including pain, skin and tissue changes or functional limitations in the affected area.
Chronic Oedema	is oedema of 3 or more months duration, and is indicative of a lymphatic system which is unable to clear the excess. In practice the management becomes similar over time.
Lymphoedema	is both a symptom and a condition. As a symptom, lymphoedema is oedema caused by an overload failure of the lymphatic system. As a condition, lymphoedema is the failure of the lymphatic system itself that results in oedema. Lymphoedema can be either a primary or a secondary condition.
Primary Lymphoedema	is a condition arising from a developmental abnormality in the lymphatic system which may manifest at birth, during childhood or adulthood.
Secondary Lymphoedema	is a condition that occurs in previously healthy lymphatic vessels or lymph nodes as a result of disease or injury such as cancer and its treatment or other tissue trauma.
Lymphoedema Specialist Practitioners	are health care professionals who have undertaken post-registration education in lymphoedema and whose job description includes a specific role in relation to lymphoedema, job titles may include lymphoedema practitioner, lymphoedema key worker, lymphoedema

specialist, or advanced lymphoedema practitioner.

Generalist Health Care Professionals are health care professionals, nurses, doctors and allied health professionals, who have not undertaken post-registration education in lymphoedema, although they may be specialists in their own field e.g. oncology.

Additional terms in Phase 2

Autonomy is a desire to organise ones experiences and activity to be concordant with one's sense of self (Deci and Ryan 2000).

Dialectic is defined in this thesis as facilitating rational discussion of alternative explanations for findings. The aim being not to find the truth but an understanding which has meaning to the participants sufficient to proceed to the next action, in so doing accepting that the interpretation may be temporary and change with new findings.

Reification making concrete something which is abstract. It can be a process or a product (Wenger 1998, p60), in a CoP it expresses a shared meaning.

Relatedness “a sense of belonging and connectedness to the persons, group, or culture” (Ryan and Deci 2000, p64).

belonging involves engagement, imagination (as part of a greater whole), and alignment (Wenger 1998, p173).

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