Scoping the potential for a core capability framework for using technology to support improvement and transformation of health and social services

Report to NES, SSSC & SCTT

December 2014
1 Introduction

The purpose of the study is to scope the potential nature of a core capability framework for health and social services staff, citizens and carers to use technology to support frontline delivery of care, service improvement and transformation as set out in the 2020 Vision\textsuperscript{1}, the associated Workforce 2020 Vision\textsuperscript{2} and Workforce Integration Plan\textsuperscript{3}.

1.1 Background

In 2013, the Scottish Government eHealth Strategy Board and the national Knowledge Advisory Board for Health and social Services sponsored NHS Education for Scotland (NES), NHS 24, the Scottish Centre for Telehealth and Telecare (SCTT), and the Scottish Social Services Council (SSSC) in working together to develop proposals for a national technology-enabled workforce learning plan. Development of this learning plan was identified as an essential response to key strategic drivers:

- The commitment within Everyone Matters: 2020 Workforce Vision\textsuperscript{4} to “...\textit{Improve patient care and overall performance... by ensuring that everyone is supported to make the best use of new technology... and has fair and appropriate access to learning and development opportunities.}”
- The draft refreshed eHealth Strategy commitment to make greater investment in the people who deliver services through enhanced workforce development and effective leadership. The refreshed eHealth Strategy recognises that that the strategic priority is education in exploiting technology and information to improve and transform services, delivering the person-centred, community-focused models of care described in the 2020 Vision and wider public services reform agenda.

In 2013 and 2014, NES, SSSC, NHS24 and SCTT consulted key stakeholders across the health and social care workforces to gather their insights into priorities for the action plan, and ways in which they could contribute to it\textsuperscript{5}. This provided the following ‘emerging vision’ of “everyday learning by doing”:

\textit{“People throughout Scotland’s health and social services – staff, carers, citizens – being empowered to use technology for continuous learning and improvement, as an integral part of everyday activity, to improve health and wellbeing.”}

The 2013-14 consultation also led to the following specific recommendations:

\begin{thebibliography}{9}

\bibitem{4} http://www.scotland.gov.uk/Publications/2013/07/4225
\bibitem{5} Paper to the eHealth Strategy Board November 2013: Developing a Strategic Action Plan for Technology-Enabled Learning for Scotland’s Health and Social Services: Report and Recommendations form stakeholder consultation,
A. A Coherent Technology-Enabled Learning Landscape
   1. Create a connected learning landscape by linking and signposting online learning resources and social learning tools provided by national services across health and social services.
   2. Provide new channels for learning “at point of care, and anytime, anywhere” - including online decision support embedded in clinical and care management systems; mobile solutions; video and social media channels.
   3. The technology-enabled learning platform should support priority features and services, including single-sign-on; updating services; an open access repository for research and development reports; testing the Open Badges approach to accrediting learning.
   4. Provide “quick win” integrated learning opportunities for priority topics – e.g. self-management, service improvement, co-production and use of community assets.

B. Developing workforce capabilities in using technology
   1. Provide a programme of promotion and communication to improve awareness and use of existing learning resources and tools across partner agencies.
   2. Develop organisational leadership and culture around technology-enabled learning.
   3. Deliver a system-wide learning programme which supports foundation to leadership capability in technology-enabled learning.
   4. Support educators and learning facilitators to exploit technology for learning.
   5. Make it real - build skills for using technology in high-impact target groups and demonstrator contexts – for example, support workers, middle managers and first-level line managers; and telehealthcare transformation programmes.

The consultation also stressed that the implementation of the recommendations depended on developing the organisational readiness for the use of technology for learning and knowledge exchange, including executive level support and support within ICT governance.

Some of the recommendations around a coherent technology-enabled learning landscape are now being progressed through NES’ Digital Transformation Programme. In spring 2014, NES, SSSC, NHS24 and SCTT commissioned SMCI Associates to undertake three related pieces of work:
- A baseline survey to assess the current levels of technology-enabled learning access, skills and support across Scotland’s health and social services workforces (this report).
- A mapping exercise to identify online learning resources which could form part of an integrated learning platform (SMCI Associates (2015): Mapping of National Online Knowledge and Learning Systems across Scotland’s Health and Social Services).

These projects were designed to progress the second group of recommendations – around building a technology-enabled workforce.
1.2 Scope of the research

The research was designed to scope the potential nature of a Core Capability Framework for Technology-Enabled Learning will define knowledge, skills, behaviours and attitudes which enable people to use technology:

1. As an integral part of everyday activity in delivering care, shared decision-making and self-management.

2. To access, share and apply learning when and where it is needed, based on an ethos of ongoing learning as an integral part of day to day evidence based practice, supporting decision making and self-directed, reflective and situated learning.

3. To continuously improve and transform services in line with the 2020 Vision, the associated 2020 Workforce Vision and Workforce Integration Plan. Specifically, this includes use of technology to support:
   a. Integrated working across health and social services, including statutory, third and independent sectors.
   b. Shifting the balance from hospital-based care to delivery of care in the community and in homely settings.
   c. Change and extension of roles – e.g. the growing importance of support workers, care home workers and others in delivering new models of care.
   d. Assets-based, co-production approaches that engage professionals, people using services, and communities in delivering and developing services.
   e. Personalised, outcomes-focused design and delivery of services.
   f. Locality or place-based care, with strategic planning and practical delivery based around general practice clusters, working as coordinated teams with community health care staff, other primary care contractors, social services staff, third and independent sectors.
   g. Distributed leadership and continuous quality improvement across sectors as enablers of service transformation.

The scoping research does not address organisational capabilities (eg C&IT infrastructure).

The audience for the core capability framework will include all partners in care – health and social services workers at all levels, in practice, support and management roles, across statutory, third and independent sectors; and service users, carers and families participating in personalised services, self-management and shared decision-making.

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6 Defining a core capability framework for using technology to support improvement and transformation of health and social services: Project Brief
7 Not stated in the project brief, but clarified with the steering group subsequently. See appendix B for membership of steering group.
1.3 Approach and methods

The research involved three elements:
1. A rapid literature review, see appendix A for search strategy.
3. Identification of key capabilities issues from the national baseline survey of access and capabilities in using technology across the health and social care workforces.
2 Rapid literature review

The literature search took place in three phases: May/June, November and December 2014. The initial search identified nine references – including two in the grey literature. Five further references – including two in the grey literature – were identified in the first follow-up search; and two in the second follow-up search. See appendix A for the search strategy.

2.1 Baseline studies of capabilities in technology in the health and social care workforces.

Two recent surveys have provided some baseline information about the current digital capabilities of the nursing workforce, and the social care workforce respectively.


The findings of this recent RCN survey supports other research cited in this review about the importance of institutional/organisational factors that shape ICT usage amongst healthcare staff; these can either facilitate or hinder usage of ICT, regardless of the knowledge, skills and attitudes of staff.

This online survey of 1158 nursing staff throughout the UK was designed to explore nurses’ knowledge, experience and attitudes relating to ehealth, and to investigate barriers to nurses’ use of ICT. The survey was undertaken during October-November 2012. Survey participants were recruited via email invitations issued to a random sample of 50,000 RCN members. Just over 80% of participants were based in England; 9% worked in Scotland, and the remainder were split equally between Northern Ireland and Wales. Participants reported working in a wide range of nursing specialisms such as acute care, primary and community care, mental health, older people, cancer care, palliative care, children and young people, and midwifery.

The RCN survey did not include a specific question on technology-enabled learning. However, the survey found that 85% of respondents reported feeling confident or very confident in using ICT (2013:8). The overall picture of nurses’ experiences of using ICT is more nuanced. The survey did ask:

- What respondents used ICT for
- whether respondents had received training in ICT;
- how long ago respondents had most recently received training in how to use an ICT application;
- whether respondents had received training in the following topics:
  - Electronic patient record keeping,
  - Finding and using evidence-based information,
  - Keeping patient information secure and confidential,
  - Remote communication with patients,
  - Standardised clinical terminology
  - Telehealth/telecare
  - The role of technology in health and social care
Using patient data to improve practice

The survey found that whilst 70% of respondents reported using a clinical information system in their work, only 14.6% of respondents had received any formal training on using patient data to improve practice. The survey report states that the potential uses of clinical information systems extend beyond the recording of patient data for monitoring; they enable patient data to be re-used in order to plan service delivery and improve patient outcomes. In light of this, the report argues that,

“...further efforts are required within education and health organisations to ensure that nurses at all levels of seniority have the knowledge to plan, collect and make effective use of the information recorded as part of the care process" (2013:16)

The survey uncovered low levels of experience and knowledge of telehealth; whilst over 60% of respondents claimed to have heard of telehealth, the same proportion reported that they had no actual experience of using any form of telehealth. In response to a range of questions relating to the impact of telehealth upon, for example, staff relationships with patients, effective management of chronic conditions, efficient working etc, around 35% of respondents reported that they “didn’t know” about the impact of telehealth. The survey report highlights the need for greatly increased nurse training in telehealth competence, although it does not identify specific competencies that ought to be developed amongst the nursing workforce.

A further area of skills development identified by the RCN relates to nurses’ ability to help patients to search for information about health conditions and treatments using electronic resources. The report states that,

“It is [...] important that nursing staff are enabled to see this role as a vital component in providing holistic personalised care” (2013: 17).

It was notable that almost half of all respondents reported that they were not consulted about the introduction of eHealth developments in their workplace; further, more than ¾ of survey respondents reported that they had little or no influence on eHealth use in their workplace (2013: 8). In light of these findings, one of the key recommendations of the report is that,

“it is vital that senior nurses have positions of influence on boards and commissioning groups to promote nursing input to service transformations facilitated by eHealth, and ensure that the nursing workforce is supported with appropriate ICT tools and systems, and competence in informatics.” (2013: 5)

Thus, effective leadership was identified by the report as a crucial element necessary for the evolution of a “digital health care service” (2013:16).

An important theme in the RCN report relates to barriers to ICT usage amongst nurses. A lack of available ICT equipment was cited by 38% of respondents as a barrier to using ICT. Respondents also identified a slow logging-on process as a barrier to ICT usage, alongside the competing pressures of other work demands.
This survey research was conducted as part of a wider Skills for Care research programme on digital capabilities in the adult social care workforce in England. The research provided an evidence base about workforce digital capabilities and to inform the development of a strategy and support programme for ‘Digital Working, Learning and Information Sharing’ from Skills for Care. The purpose of the surveys was to gain insight from as broad a range of social care organisations as possible into the uses of digital technologies in the workplace and the skills issues raised. Two surveys were developed, one for managers and one for staff. The surveys were principally quantitative, with a series of rating/ranking type questions covering uses of and attitudes towards digital technologies and digital skills issues. The surveys were disseminated primarily online via a range of relevant social care email networks and social media. There was also a paper-based version of the staff survey, and managers were enlisted to facilitate staff participation. A total of 539 surveys returned, comprising 236 managers and 303 staff.

The surveys addressed:
- Uses of digital technologies.
- Staff access to devices.
- Attitudes to digital technologies.
- Digital capabilities in the workforce.
- Digital skills support.

### 2.1.2.1 Uses of digital technologies
- The use of digital technologies is pervasive in the activities of the social care organisations surveyed – over 95% of respondents reported its use in at least one aspect of their activities.
- Digital technologies are most pervasive in generic organisational activities, particularly internal and external communication, workforce learning and development, and people management.
- Digital technologies are slightly less pervasive in care specific administration activities such as recording care plans or managing the delivery of care, but even here the great majority of managers (around 80%) and of staff (around 70%) report its use.
- Digital technologies are also having an impact on the direct interactions between care staff and the people they support. Over half of staff respondents said they use digital technologies to find information about care and support, to support communication with family and friends, or to plan leisure activities with the people they are supporting.

### 2.1.2.2 Staff access to devices
- The device most commonly used by social care staff for work purposes is the desktop computer provided by the employer – two-thirds of respondents report using one; a third of staff use laptops provided by their employer for work.
• The use of tablet computers for work is still relatively low – they are used by fewer than one in five staff; about half of these staff are using their own device, and half using one provided by their employer.
• Almost three quarters of staff have their own smartphone, and one fifth of staff report using their personal smartphone for work purposes.
• Overall, personal use of mobile digital devices – smartphones, laptops and tablets – is considerably higher than workplace use, suggesting that in terms of mobile devices at least, individual staff are more digitally engaged than their employers are.

2.1.2.3 Attitudes to digital technologies
• The great majority of both managers and staff are convinced of the potential benefits of digital technology and its capacity to improve the efficiency and the quality of care services, and to benefit the people they support.
• Over half of managers see access to digital technologies for all staff as the biggest stumbling block to digital uptake, and nearly four-fifths of staff feel that digital technologies should be made available to all workers.
• While the majority of managers have reasonable confidence in their ability to get expert technical advice about digital systems and in their ability to maintain safety and security, around a third had some doubts in these areas.
• The majority of managers felt that lack of staff capability inhibits the use of digital technologies, and that the pace of technological change presents a challenge to maintaining staff skills; older staff were seen to be particularly in need of skills support.
• A small but significant minority of staff felt there was a risk that the use of digital technologies could be at the expense of spending time with the people they support; data security issues were also a concern for some staff, but not the majority.

2.1.2.4 Digital capabilities in the workforce
• Social care managers’ report a significant shortage of basic online skills and knowledge across all levels of the workforce.
• Two-thirds of managers feel that the workforce as a whole lacks sufficient information literacy skills (the ability to find, evaluate and share online information), and also that digital champion skills (the ability to help others to use digital technologies) are insufficient.
• Three-quarters of managers feel knowledge about digital assisted living technologies is lacking across all parts of their workforce; technological advances may be significantly outpacing the sector’s capacity to make use of them.
• Staff respondents feel considerably more confident about their own digital capabilities than managers’ reports might suggest; over 90% of staff say they are confident or very confident about their basic online skills, whereas fewer than half of managers feel these skills are present in sufficient quantity in their workforce.
• The ‘perception mismatch’ between managers and staff is especially noticeable for digital literacy and digital champion skills; more than four-fifths of staff say they feel confident about these skills, whereas less than a quarter of managers’ report having enough of these skills amongst frontline staff.
2.1.2.5 Digital skills support

- Both managers and staff report coaching/help from colleagues or managers and formal IT training as the most common forms of digital skills support currently offered.
- The staff surveyed express a preference for either formal IT training or for time for self-guided learning in order to improve their digital skills.

2.2 Factors affecting use of technology in the health and social care workforces

The literature contains many single studies about aspects of service delivery, workforce development or organisational practice that involve digital technologies: we focused on those that specifically mentioned capability and/or competence.

2.2.1 Skills for Care (2014): Digital capabilities in the social care workforce: Rapid evidence review

This rapid review was undertaken to establish the existing evidence base for work in this area, addressing the following questions:

- To what extent are digital technologies embedded in the daily working lives of the social care workforce?
- What are the main uses of digital technologies in the delivery of social care?
- What are the main barriers to the further use of digital technologies?
- What facilitates or inhibits digital capability in the social care workforce?

It was part of a wider research project designed to better understand how digital technologies are used in and by the adult social care workforce in England. The particular focus of the project is on the skills required to use digital technologies effectively in the social care context. The research informed the development of a ‘Strategy for Digital Working, Learning and Information Sharing’, with which Skills for Care has been tasked by the Department of Health.

The review did not focus on workforce capabilities/competence, but it did note:

“However, references to digital capabilities in social care national occupational standards are very sparse and focus on the purely functional skills of using particular devices.”

The review found ‘evidence to suggest that’:

- Social care employers see the set-up costs of digital technology as a barrier to further uptake.
- Lack of staff skills is also considered to be a barrier by managers and by some staff.
- Lack of time is cited by some employers and staff as a brake on the use of digital technologies for information seeking.

In relation to facilitators, the review found that:

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• There is very little robust evaluation of interventions to support digital literacy; programmes using a ‘champions’ approach to skills support show an increased awareness of and confidence about using digital technologies amongst their target beneficiaries.

• The strongest facilitator is likely to be recognition of the benefits of digital technology in achieving an existing aim or addressing an existing need.

• There are demographic factors at play; digital literacy decreases with age and increases with qualification levels of individuals.

• There is some evidence of a lack of management support for using digital technologies in the social care sector, which in turn will inhibit the development and maintenance of digital literacy.


This systematic review of 14 studies examines factors that influence the acceptance of telehealth technologies by healthcare personnel involved in the direct delivery of telehealth (predominantly nurses, although other healthcare professionals were also represented). The review focuses upon the use of telehealth technologies for the management of COPD and chronic heart failure. Of the 14 studies included in the review, 10 were UK-based. Of the remaining 4 studies, 1 study was undertaken in each of Denmark, Canada, Australia and the Netherlands.

Key findings of the review are that:

• Implementation of telehealth needs staff support; otherwise pilot projects are often unsustainable.

• Involvement of staff in service design aids acceptance of telehealth technologies.

• Staff want to continue to use clinical knowledge and judgement whilst using telehealth; otherwise, telehealth is regarded as a challenge to competence and professional identity.

• The reliability and accuracy of telehealth equipment is critical; if staff don’t trust equipment, they won’t use it.

This paper does not specifically focus upon capabilities. However, it does suggest that healthcare organisations need to carefully consider ways in which staff can be included in the design and implementation of telehealth technologies. This is relevant to the dimensions of the capability frameworks related to behaviours and attitudes, in as much as staff attitudes and behaviours may be strongly influenced by the manner in which organisations introduce and incorporate telehealth technologies into service delivery.


This paper reviews 11 studies in order to explore the effectiveness of technology-enabled (TE) tools in facilitating knowledge acquisition in the context of post-registration nurse education. The review also evaluates the perceived benefit of TE tools compared to more traditional modes of learning within healthcare education. Petty contextualises the review by outlining the challenge presented by
the need to ensure that nurses receive specialist post-registration training, even though contact hours for such training are currently being reduced. Self-directed study time for nurses now outweighs classroom-based learning. Advocates argue that online education tools support independent learning through active participation and interaction with the technology (Petty, 2013:54).

Of the 11 studies included in Petty’s review, 4 were conducted in the US, 2 in the UK, and 1 each in Ireland, Thailand and Denmark (it is not stated where the remaining 2 studies were undertaken). Based on the findings of the included studies, Petty argues that the evidence is mixed concerning the extent to which TE tools contribute to improvements in knowledge and skills. So, whilst some of the reviewed studies found that some TE tools (such as CD-roms) were beneficial in promoting knowledge/skills acquisition, Petty raises some methodological concerns about how possible it is to capture and measure “learning” (2013:58). Further, Petty also argues that it is important to acknowledge that TE tools may not suit all learners, and therefore TE materials should be just one of a range of methods employed to deliver healthcare education – an approach termed “blended learning” (Petty, 2013: 58). The review does, however, highlight more consistent findings that learners gain greater satisfaction from using TE tools compared to more conventional modes of learning.

Petty’s paper was included in the review because it specifically makes reference to technology-enabled learning (and indeed, it is the only paper included in the review that does make reference to TEL). However, the focus of the paper is not on individual capabilities; therefore, the findings from the paper are of limited value to this review. It does, however, serve as a useful reminder that TEL may not be the most effective mode of learning for ALL members of the health and social care workforce.


This meta-review of literature on the topic of the implementation of e-health technologies in healthcare settings, focuses on reviews published between 1995-2009. The review was designed firstly to identify barriers and facilitators to e-health implementation processes, and secondly, to identify the main gaps in the literature. Inclusion criteria were met by 37 papers. Of these, 18 were authored by researchers based in the USA, 10 in Canada, 3 in the UK, 2 in the Netherlands and 1 each in Australia, Germany, Malaysia and Norway (Mair et al, 2012:359).

The authors use Normalization Process Theory (NPT) as a conceptual framework for interpreting data on e-health implementation processes. NPT identifies four dimensions of implementation processes: coherence, cognitive participation, collective action, and reflexive monitoring (Mair et al, 2012:358). Coherence refers to how individuals make sense of a new e-health service – that is, how they understand its function and potential benefits (2012: 360). Cognitive participation refers to attempts to get potential users to engage with new e-health systems – for example, by recruiting local “champions” (2012: 360). Collective action relates to the work involved by individuals, groups and organisations to implement a new e-health system. Reflexive monitoring refers to ways in which
users of e-health systems evaluate them. These four dimensions, or constructs, were used as a coding framework to categorize each individual finding (or “attributive statement”) pertaining to barriers/facilitators of e-health implementation, from every one of the 37 reviews. The meta-analysis process identified 801 attributive statements about implementation processes across the 37 reviews (Mair et al, 2012: 360).

The most relevant findings of the paper in relation to TEL capabilities are the gaps identified in the e-health implementation literature relating firstly to cognitive participation, and secondly to roles, responsibilities and training. Of the 801 attributive statements extracted from the data by the authors, only 10% related to engaging with users of e-health systems, even though actively involving health professionals is vital for the successful implementation of new e-health systems (2012:360). Similarly, only 10% of attributive statements referred to “roles, responsibilities and training or support issues”. Furthermore, the authors assert that “these issues were often discussed superficially, without examining the types of training or ongoing support that would be required” (2012:360). Mair et al conclude that their review 

“... highlights a continued focus on organizational issues, which despite their importance, are only one among a range of factors that need to be considered when implementing e-health systems” (2012:361).


Achieving adoption, use, and integration of information and communication technology by healthcare clinicians in the workplace is recognized as a challenge that requires a multifaceted approach. This article explores community health nurses’ engagement with information and communication technology as part of a larger research project that investigated the delivery of self-management support to people with chronic obstructive pulmonary disease. Following a survey of computer skills, participants were provided with computer training to support use of the project information system.

Changes in practice were explored using action research meetings and individual semi-structured interviews. Results highlight three domains that affected nurses’ acceptance, use and integration of information and communication technology into practice:

• Environmental issues.
• Factors in building capacity, confidence, and trust in the technology.
• Developing competence.

The research found that nurses face individual and practice challenges when attempting to integrate new processes into work activities. The use of participatory models such as collaborative and reflective workgroups was recommended as a key mechanism to address the issue of practice change and its sustainability.

This paper reviews 79 studies of health care staff attitudes to IT. Just over half of these studies were undertaken in the US; in total, the studies were conducted in 16 countries. One of the key findings is that experience and confidence in IT use positively influences staff attitudes towards IT implementation in the workplace. Furthermore, general competence in IT amongst staff is crucial for effective implementation (2008: 92, 94). However, one of the main barriers to successful implementation is if staff feel that their professional role is being challenged by the introduction of IT. This finding points to the need for healthcare organisations to introduce adequate training and education to demonstrate the value of IT to frontline staff before implementing new systems. Whilst the findings from Ward et al’s review are not about individual capabilities per se, they have implications for organisations that seek to promote particular attitudes and behaviours in relation to TEL. The review suggests that IT training for healthcare professionals should be an integral part of undergraduate/postgraduate/CPD training (Ward et al, 2008: 93). The review also highlights the importance of strong leadership to the successful implementation of new IT systems, citing Doolan et al (2003), who found that high-level leadership was the number-one contributor to the successful adoption of clinical information systems (Ward et al, 2008: 87).

2.3 Leadership and use of technology in the health and social care workforces


This paper, authored by a team based primarily in Australia, reports on a systematic review designed to examine evidence of associations between clinical leadership and successful IT adoption in healthcare organisations. The review process identified 32 published papers that met the specified inclusion criteria; 17 of these papers were published after 2010, illustrating the expansion of work in this area in recent years. The authors state that the studies included in the review originated in the US (53%), Western Europe (19%), Canada (13%), Asia or South America (9%) and Australia/New Zealand (6%) (2014:398).The authors uncovered strong linkages between various attributes of clinical leaders and IT adoption.

The paper concludes that in order for successful IT adoption to occur, clinical leaders need to do the following: cultivate their own IT competencies; establish positive working partnerships with IT professionals, and engage in the following proactive leadership behaviours:

• Communicate clear vision and goals for IT adoption.
• Provide leadership support.
• Establish a governance structure.
• Establish training.
• Identify and appoint champions.
• Address work process change.
• Follow-up (e.g. request regular updates from staff; adopt a proactive stance during setbacks).

Ingebrigtsen et al’s paper is concerned with the implementation of IT systems, rather than the use of TEL per se. However, the leadership behaviours identified by the review might usefully be incorporated into a TEL capability framework.


This paper argues that health care reform and revolution requires leadership competencies that integrate the digital realities of time, space, and media. The authors assert that leadership skills and behaviors of command, control, and directing from pre-digital times are no longer effective, given the impacts of the digital changes. They present ten competencies necessary for contemporary executive leadership:
1. Evidence driven consciousness.
2. Generation flux: competence across all generations.
3. Digital competence.
4. Innovation leadership expertise.
5. Personal-professional boundaries.
6. Commitment to lifelong learning.
7. Trans-disciplinary teamwork and the ability to aspire a team vision.

In relation to ‘digital competence’, the authors say:

“Simply stated, executives must fully embrace technology and be informed and competent to use the Internet, communication systems, and data warehouses. Knowing where and how data are produced and manipulated is critical to making decisions on reliable data. Failure to become technically competent creates a fast track to early retirement.”

2.3.3 Giordano, R., Clark, M., Goodwin, N. (2011) Perspectives on telehealth and telecare: learning from the 12 Whole System Demonstrator Action Network (WSDAN) sites, London: The King’s Fund

This briefing paper reports on lessons learned from the implementation of telehealth and telecare services in twelve sites throughout England between 2008-2011. Each site generally comprised a primary care trust and a local authority; together, the twelve sites formed the Whole System Demonstrator Action Network (WSDAN). WSDAN was funded by The King’s Fund and the Department of Health.

In common with the other papers included in this review, Giordano et al’s briefing paper does not report on competencies or capabilities specifically relating to the use of TEL in health and social care.
However, the report does offer some commentary regarding key leadership qualities associated with the successful implementation of telehealth and telecare; these attributes of successful leaders may be pertinent to the formulation of a TEL capability framework:

• Ability to delegate authority and responsibility.
• Well-developed communication and persuasion skills, within and outside organisational boundaries.
• Ability to build and maintain a vision across all levels and categories of staff.
• Ability to engender shared ownership with stakeholders (including users and their carers).
• Ability to maintain a continued focus over time.
• Skills in project and resource management.

(Giordano et al, 2011: 10)

The report also identified a range of specific workforce skills necessary for the effective implementation of telehealth, which include:

• Managing and triaging large caseloads.
• Using data to make decisions.
• Developing and then adhering to assessment and treatment protocols.
• Communicating and sharing the right data across interdisciplinary teams.
• Choosing and evaluating the most appropriate technologies.

(Giordano et al, 2011: 17-18).

These workforce skills are also relevant to the use of TEL to improve and integrate service delivery across health and social care; thus, it would be appropriate to consider them for inclusion in a capability framework. Giordano et al observed that there was a general lack of professional training to develop these skills within the workforce; the report argues that there is a need for a national strategy to ensure that workers are trained in these skills (2011:18). Alongside skills development, the authors also highlight the need to change everyday working practices in order to support technology-enabled services. They acknowledge, however, that attempts to engender shifts in working practices are often met with resistance from staff, particularly within the health sector. Drawing on experiences within the WSDAN sites, the report asserts that the most effective strategy for engaging the wider workforce is to include clinicians in the earliest stages of project design and planning (Giordano et al, 2011: 14).

### 2.4 Competencies

Three papers were identified which directly focused on the development of individuals’ competencies.


This paper looked at the implications of the increasing use of Assisted Living Technology in the social care sector and to assess the implications for the workforce in terms of job roles, skills, knowledge, training and support. It draws from research (including a national online survey with 254 responses)
undertaken by the authors which was commissioned by Skills for Care (SfC), and uses the SfC definition of Assisted Living Technology (ALT):

“.. the use of Assistive Technology in this sector encompasses three key services: telecare and telehealth installed in the homes of those needing health and/or social care support to enable them to live longer at home and in their communities; digital participation services designed to educate, entertain, and stimulate social interaction to enrich the lives of people in need of social support living at home; and wellness services to encourage people to adopt and maintain a healthy lifestyle, to help prevent or delay the need for additional health and/or social care support.”

The research showed that technical and IT skills were “not necessarily seen as very important to the delivery of ALT generally, or telecare specifically”:

“Survey respondents rated both technical and IT skills as less important than observational, communication, listening skills, or the ability to match the most appropriate kinds of Assisted Living Technology to clients’ needs and their living environment. When asked specifically about telecare, similar views were expressed by case study interviewees, who regarded specialist technical expertise as important, but had a general perception that all telecare-related roles also require general knowledge about the people using the service and their vulnerability, as well as wider social and communication skills.”

The following skills were identified as “necessary” for ALT:

- The ability to listen and communicate effectively with service users.
- Knowledge of the range of technology available.
- Skills in matching equipment to users’ needs and home environment.
- Knowledge and skills to promote independence.

The research also found that learning and development support for the social care workforce engaged with ALT provision is currently ad hoc, disparate, and provided primarily by individual employers or by Assisted Living Technology suppliers and manufacturers. It called for the development of a “learning and development framework” with incorporated the skills and knowledge required by staff working with ALT, and which

“.. encompass[es] technical skills but also wider communication and social skills relating to: effective interaction with service users, their families, and carers; and the kinds of Assisted Living Technology which are most effective for particular health conditions and home environments.”


The authors note the lack of literature concerning telehealth competency training, and argue that their study seeks to fill this gap by identifying “specific competencies necessary to deliver effective behavioural telehealth services” (2012:12)
The paper reports the findings of a very small-scale study that evaluated the effectiveness of a competency-based training programme offered to 21 behavioural telehealth providers in rural Alaska. The training, provided by the Alaska Rural Behavioral Health Training Academy, covered the roles and responsibilities of telehealth coordinators and telehealth therapists. Knowledge and understanding of these roles and responsibilities comprised 14 competencies, summarised below. Telehealth coordinators work at the distal site, and act as intermediaries between the therapist and client; they are required to be very knowledgeable about the video-conferencing equipment being used. Specifically, telehealth coordinators are responsible for:

- Checking equipment for correct functioning prior to client sessions.
- Ensuring appropriate paperwork is collected and returned to the therapist.
- Ensuring privacy and confidentiality during therapy sessions – for example, by ensuring that the therapy session is not interrupted by others.
- Training the client on how to use the video-conferencing equipment.
- Providing the client with a plan for dealing with equipment failure.
- Introducing the client to the therapist, via the videoconferencing equipment.

Therapists’ roles and responsibilities include:

- Effectively managing technology, including monitoring, and if necessary, re-framing their own appearance on the client’s screen, and giving instructions to the client about how to use the remote control.
- Managing relevant paperwork; ensuring that the client has a copy of necessary documents.
- Fostering privacy and confidentiality; this “includes the therapist spanning the office with the camera allowing the client to see that no one else is present in the office at the distal site.” (2012:6).
- Demonstrating video “presence”: conveying empathy on video via body language and visual attention; also, awareness of technical presentation issues such as the influence of lighting etc. on video quality.
- Understanding the importance of both acknowledging and responding appropriately to any technical difficulties that arise with the video-conferencing technology.
- Working with telehealth coordinator to maintain client confidentiality through secure storage of paperwork and case notes; planning for emergencies and crisis intervention procedures.
- Demonstrating sensitivity to the client’s cultural context.

The study employed video vignettes to assess these competencies. Participants watched two sets of video vignettes of mock therapy sessions; one set pre-training, and one set post-training. Participants were asked respond to written prompts designed to evaluate their understanding of specific competencies relevant to each vignette scenario. As a result of the training, participants’ competency scores improved by over 50% (Gifford et al, 2012:9). The training also included several opportunities for participants to practise using video-conferencing equipment, and thus familiarise themselves with it. The study measured participants’ post-training self-perceptions regarding their own behavioural telehealth competency, which were generally positive, although the authors acknowledge that as they did not gather data on participants’ perceptions pre-training, this evidence is relatively weak (2012:11).
The competencies in which the participants displayed most improvement were in understanding that therapists need to demonstrate video “presence”, in order to compensate for the loss of a range of non-verbal communication cues that occurs when therapeutic encounters take place via videoconferencing (Gifford et al, 2012:9). The authors argue that these are the same skills that are particularly important for fostering therapeutic relationships via videoconferencing equipment. Whilst this paper presents the results of one very small study, it is nevertheless appropriate to consider the competencies it identifies as suitable for inclusion within a capabilities framework for TEL.


This paper reports on a study to develop a computer literacy scale for newly enrolled students and investigated their current levels of computer literacy to develop computer courses appropriate to these students’ skill levels and needs.

Lin noted that

“The advantages of IT led the American Nurses Association to recognize nursing informatics as a specialty in 1994 (Murphy, 2010). Maag (2006) suggested assessing nursing students for computer competency during the admission process and then providing appropriate courses on computer skills. Thompson and Skiba (2008) also believed computer skills necessary to work in a technology-rich healthcare environment to already be an essential part of the nursing profession.”

Lin defines ‘computer literacy’ as basic computer skills, whereas ‘computer competency’ is defined as the computer skills necessary to accomplish job tasks.

The computer literacy scale developed through the study included six constructs:
• Software.
• Hardware.
• Multimedia.
• Network.
• Information ethics.
• Information security.

This study also found that participants earned the highest scores for the network domain and the lowest score for the hardware domain. It concluded that:

“With increasing use of information technology applications, courses related to hardware topics should be increased to improve nurse problem-solving abilities. This study recommends that emphases on word processing and network-related topics may be reduced in favor of an increased emphasis on database, statistical software, hospital information systems, and information ethics.”
2.5 Digital Competence: a complementary theme

Initial review work uncovered a range of models/frameworks for assessing digital literacy/digital competence. A significant body of work has been funded by the European Commission; the next section offers a brief summary of a key report.


This report reviews 15 frameworks for the development of digital competence. The frameworks were developed in a range of European and North American contexts, including academic studies, educational resources for primary and secondary school teachers in the UK, and several ICT training programmes designed variously for children, adults and elderly people. For a full list of the frameworks reviewed, please see http://ftp.jrc.es/EURdoc/JRC68116.pdf

Ferrari offers the following definition of digital competence, based upon a synthesis of definitions of digital literacy/digital competence drawn from the frameworks reviewed:

“Digital competence is the set of knowledge, skills, attitudes (thus including abilities, strategies, values and awareness) that are required when using ICT and digital media to perform tasks; solve problems; communicate; manage information; collaborate; create and share content; and build knowledge effectively, efficiently, appropriately, critically, creatively, autonomously, flexibly, ethically, reflectively, for work, leisure, participation, learning, socialising, consuming, and empowerment.” (Ferrari, 2012: 3-4)

In the quotation presented above, we have emboldened those words which refer to attitudes that Ferrari considers should be taken into account when developing a digital competence framework. Ferrari’s analysis indicates that digital competence refers to more than technical skills – the following 7 competence areas have been synthesised from the 15 frameworks under review (p4):

a. Information management: ability to identify, locate, access, retrieve, store and organise information
b. Collaboration: ability to link with others, participate in online networks and communities; interact constructively
c. Communication and sharing: communicate through online tools, taking into account privacy, safety and netiquette
d. Creation of content and knowledge: integrate and re-elaborate previous knowledge and content; construct new knowledge
e. Ethics and responsibility: behave in an ethical and responsible way, aware of legal frameworks
f. Evaluation and problem-solving: identify digital needs, solve problems through digital means; assess the information retrieved
g. Technical operations: use technology and media, perform tasks through digital tools

Ferrari’s analysis of digital competence frameworks thus identifies a wide range of knowledge, skills and attitudes that would be relevant to the development of a TEL capability framework.

This paper provides an overview of current digital, online, and electronic social work services, and identifies “compelling” ethical issues, including those related to practitioner competence. It draws on the National Association of Social Workers Code of Ethics to argue that social workers who use “digital and other electronic forms of technology to serve clients” have a moral obligation to review relevant research and practice literature and to become familiar with developing ethical standards.

2.6 Summary of main themes in the literature

2.6.1 Paucity of available literature regarding TEL capabilities

The most significant finding of this rapid review is the absence of literature on the topic under review. Despite using a range of search terms, not a single academic article was found that focuses specifically on capabilities for technology-enabled learning. It is possible that this may be explained by the use of inappropriate search terms: this was not a full-scale literature review. However, the follow-up review double checked for further literature across a wider range of databases, and under wide search terms (see appendix A), and rendered very little.

Gifford et al (2012) and Mair et al (2012), and the recent Skills for Care work (2014) note gaps in the literature relating to the topic of individual capabilities/competencies for the use of technology within health and social care. This absence of literature focusing upon individual workers’ capabilities contrasts strongly with a significant body of research concerning organisational aspects of ICT within health and social care.

2.6.2 Findings as they relate to TEL capabilities: knowledge & skills, attitudes, and behaviours

2.6.2.1 Knowledge and skills

One theme to emerge from the literature reviewed here is that in order for new technologies to be successfully implemented, all staff need to achieve general competency in IT, in addition to acquiring skills in using specific programmes, applications and digital equipment as pertinent to their role (Gifford et al, 2012; Ward et al, 2008; RCN, 2013, Lin 2011, Skills for Care 2014). Ingebrigtsen et al (2014), Malloch & Mazurek Melnyk 2013), and Giordano et al (2011) highlight the need for clinical leaders (and not just frontline staff) to be competent in IT. There is evidence that the level of practical IT knowledge and skills possessed by health workers shapes their attitudes towards the adoption of new technologies (Ward et al, 2008; RCN, 2013, Skills for Care 2014). Therefore, in seeking to develop a capability framework for TEL, it is important to recognise potential interactions between knowledge/skills, behaviours and attitudes represented in the framework.

Gifford et al (2012) and Giordano et al (2011) both identify a range of skills that are necessary for the effective delivery of telehealth services; these range from competencies relating to specific telehealth consultations (such as knowing how to operate video-conferencing equipment), to skills
associated with new working practices engendered by the implementation of telehealth (such as managing and triaging large caseloads).

Wigfield et al (2013), however, stress that technical and IT skills are less important in providing Assisted Living Technology (which includes telecare) than observational, communication, listening skills, and the ability to match the most appropriate kinds of Assisted Living Technology to clients’ needs and their living environment.

Lin (2011) suggests that emphases on word processing and network-related topics may be reduced in favour of an increased emphasis on database, statistical software, hospital information systems, and information ethics.

2.6.2.2 Behaviours

A key theme within the literature reviewed here is the identification of specific behaviours associated with successful leadership, which in turn is associated with successful adoption or implementation of new technologies (Giordano et al, 2011; Ingebrigtsen et al, 2014; Ward et al, 2008, Malloch & Mazurek Melnyk 2013). These behaviours include the communication of clear vision and goals for the adoption of new technologies; the fostering of good working relationships, both within and outside of organisational boundaries; the appointment of “local champions”; the ability to maintain focus on the process of implementation over time. These behaviours are relevant to the development of a capability framework for TEL.

2.6.2.3 Attitudes

The relationship between IT skills and attitudes towards new technologies has already been highlighted. Findings from this review suggest that attitudes towards the adoption of new technologies is also shaped by the extent to which healthcare staff feel that technologies, such as those used in telehealth, pose a challenge to their professional identities, roles and responsibilities (Brewster, 2014; Ward, 2008, RCN (2013), Skills for Care (2014)). Evidence suggests that staff are much more willing to adopt new working practices that incorporate increased use of technology to support service delivery, if they are consulted at an early stage, involved in implementation, and receive adequate training to recognise the value of the new technology in question (Ward et al, 2008, Courtney-Pratt et al 2012).

2.7 Conclusion

This review has uncovered major gaps in the literature relating to individual capabilities for using technology to support service improvement, integration and transformation. Nevertheless, whilst none of the literature reviewed here focuses directly on TEL capabilities, it has been possible to identify some skills, behaviours and attitudes that are relevant to the development of a TEL capability framework.

It is worth noting that the way in which health and social care organisations proceed with implementing the use of new technologies can have a significant impact upon staff behaviour and attitudes, which can in turn exert a powerful influence upon the likelihood of successful
implementation. Evidence suggests that telecare, telehealth and e-health projects are much more likely to succeed if both frontline staff and clinical leaders are involved in service design and implementation from an early stage (Brewster et al, 2014; Giordano et al, 2011; RCN, 2013, Courtney-Pratt et al 2012). In the light of this evidence, it is important to recognise that organisations have a crucial role to play in determining the extent to which their workforce develops appropriate TEL capabilities relating to behaviours and attitudes.

2.8 References


Skills for Care (2014): Digital capabilities in the social care workforce: Rapid evidence review

Skills for Care (2014): Digital capabilities in social care: Survey report


3 Review of relevant existing frameworks

3.1 eHealth Competency Framework (2011)

The eHealth Competency Framework\(^{10}\) was developed through a joint collaboration between the Academy of Medical Royal Colleges and the Scottish Government, and published in June 2011. Its primary focus is the medical and dental practitioners who also undertake eHealth roles at local, regional or national levels.

“The framework covers the broad range of competences that may be required for the small number of clinical staff whose main area of work is eHealth. The majority of other clinician informaticians will not be required to have an in depth knowledge of all domains covered in the framework and it is anticipated that each clinician will be able to focus on those competences most relevant to their role within their own organisation.”

The framework provides detailed competencies in relation to knowledge, skills and behaviour in the following areas:

- Clinical leadership and management.
- IT healthcare projects.
- Working with information.
- Clinical care records.
- Clinical IT systems and technologies (including telehealthcare).
- Knowledge management.
- Clinical and health IT standards.

3.2 Clinical eHealth Toolkit (2009)

The Clinical eHealth Toolkit\(^{11}\) was developed by the Scottish NMAHP eHealth leads in 2008/9. It is designed to be a practical tool to support clinical champions, and offers ‘practical pointers’ in the form of themed indicators of success designed to progress local and national eHealth programmes. The indicators of success are:

- Leadership and engagement.
- eHealth tools.
- eHealth skills.
- Knowledge management.

Each indicator is elaborated through local examples.


3.3 **SQA: Professional Development Award in Telehealthcare (SCQF 6) (November 2011)**

This qualification\(^{12}\) is targeted to telehealth support staff including:
- Equipment installation and maintenance staff.
- Call handlers.
- Paid responders.

The mandatory ‘Working in Telehealthcare’ unit is provides “the generic knowledge that underpins the delivery of a safe and effective telehealthcare service”. It covers:
- Communicate with and complete records for individuals.
- Support the health safety of yourself and individuals.
- Ensure your own actions support the care, protection and well-being of individuals.
- Relate to, and interact with, individuals.
- Ensure that your own actions support the equality, diversity and rights and responsibilities of individuals.

There are option units in installation, maintenance and repair; call handling; and response.

3.4 **Electronic Assistive Technology (eAT) and social care (2014)**

Electronic Assistive Technology (eAT) and social care\(^{13}\) provides a suite of workforce development resources designed through wide consultation across the UK to support all social care employers, assistive technology suppliers and trainers as they work together to embed eAT in social care. The resources include a knowledge and skills set outlining knowledge and skills in the following areas:
- Confidence in technology.
- Rights, values and eAT.
- Sourcing eAT.
- Assessment and review in relation to eAT.
- Safe installation, maintenance and disposal of eAT.
- Remote or virtual monitoring and response systems.

3.5 **Health & Social Care Professionals: Telehealthcare Competency Framework (November 2011)**

The draft Telehealthcare Competency Framework was developed by a collaboration of the Telecare Development Programme (Scottish Government Joint Improvement Team (JIT)) and the Scottish Centre for Telehealth. Consultation was also undertaken with service providers and relevant professional organisations. It is designed for professionals working in telehealthcare such as:
- Health and social care professionals with direct client/patient contact.
- Medical professionals, GPs, nurses, midwives, pharmacists, AHPs, Scottish Ambulance staff and social workers.

\(^{12}\) [http://www.sqa.org.uk/sqa/47947.html](http://www.sqa.org.uk/sqa/47947.html)

\(^{13}\) [http://www.technologytocare.org.uk/](http://www.technologytocare.org.uk/)
• Senior strategic and operational managers working in health, social care and housing.

The framework details mandatory competencies in relation to:

• Service delivery:
  o Demonstrate knowledge base required for role in, and how it impacts on, telehealthcare service delivery.
  o Understanding of how telehealthcare services fit into overall service delivery plan.
  o Undertake practice taking into account legal and ethical issues relating to telehealthcare
  o Recognise importance of keeping up-to-date service developments to maintain and improve competence.

• Communication:
  o Raise awareness of the potential of telehealthcare.
  o Provide information and advice as the first point of contact for users.
  o Communicate effectively using a wide range of methods.

• Quality
  o Awareness of and adherence to professional and organisational guidance re: sensitive and confidential information.
  o Maintain a record of services provided.
  o Recognise importance of informed consent.

• Health, safety and security
  o Providing a safe and secure environment for telehealthcare in practice.
  o Communicate effectively using technologies to deliver & support services.
  o Report equipment failure appropriately.
  o Knowledge of local policy and procedure for dealing with complaint.

• Professionalism and attitudes:
  o Adherence to information governance standards when dealing with patient/client data.
  o Ability to operate equipment as required by role.
  o Maintaining confidentiality.
  o Assessment for telehealthcare services.

• Personal development:
  o Learning and Development.
  o Demonstrate progress of self-development through reflective practice.
  o Training.

3.6 Telehealthcare support staff: Competency Framework (November 2010)

The draft Telehealthcare Competency Framework for support staff was developed by a collaboration of the Telecare Development Programme, (Scottish Government, Joint Improvement Team (JIT)) and the Scottish Centre for Telehealth and in consultation with service providers and managers. It details core competencies for all telehealthcare support staff roles in relation to:

• Service delivery:
  o Demonstrate knowledge based required for role and the impact on service delivery.
  o Undertake practice taking into account legal and ethical issues relating to telehealthcare.
- Recognise the importance of keeping up to date with the processes and service developments to maintain and improve competence.

- Personal development
  - Demonstrate a commitment to the need for continuing personal development in order to enhance knowledge, skills, values and attitudes needed for safe and effective practice.

- Communication
  - Communicate effectively using a range of methods in relation to sensory, physical and cognitive needs.
  - Complaints, compliments & suggestions.
  - Telephone Management.
  - Working with others.
  - Staff Conduct.

- Individual services
  - Work with service users to ensure the service meets their needs, in line with relevant standards and codes of practice, using a person-centred approach.
  - Recognises the role of the family and carer in the provision of support and care to the individual.

- Reviewing
  - Identify emerging / changing needs and potential problems.
  - Evaluate the impact of any telecare intervention.

- Health and safety
  - Understanding health and safety policies and procedures.
  - Disaster Recovery.
  - Lone Working.

- Administration
  - Carry out Administration procedures.

### 3.7 Conclusion

Detailed capabilities/competencies in telehealth/telecare/assistive technologies have been developed in several ‘frameworks’. However, there is significantly less work to identify capabilities in relation to:

- Using technology to share information for integrated and person-centred care.
- Using technology to support shared decision-making and self-management.
- Using technology in leadership and innovation.
4 Baseline analysis of access and capabilities in using technology across the health and social care workforces

In parallel with this scoping study, SMCI Associates undertook a national baseline analysis of technology enabled learning access, skills and support across Scotland’s health and social services. This used an online survey which was disseminated as widely as possible through relevant networks and organisations. Almost 13,000 (12,879) health and social care staff responded to the survey. Five percent of the NHS Scotland workforce responded to the survey, and 0.5% of the social care workforce responded.

The survey showed that:

- **Health and social care staff make considerably more use of technology at home than at work**, using more devices, and using them for different sorts of things: web-based communities, files storage and sharing and podcasts are used the most at home. This indicates that the health and social care workforces have significantly greater capabilities in using technology than are used at work.

- **Generally the health and social care workforces feel confident in using technology (68%);** however more than half (53%) would really welcome some training/support in using digital technology. Only 25% respondents consider that they have had lots of training in the use of technology, with slightly more in social care (28%).

- Almost one fifth (19%) of all health and social care staff find it difficult to find what they are looking for on the internet.

- **There is a high level of confidence in understanding about principles of confidentiality and data protection (87%) and internet safety and security (78%) across all sectors.** However, despite these high levels of confidence almost one fifth (17%) of all health and social care staff want training in the principles of confidential and data protection.

- Despite limitations in using and accessing file storage software at work, there is a high level of confidence in knowing how to share documents with colleagues digitally. This is likely to be positively influenced by the high usage of file storage and sharing outside of work.

- More respondents feel confident in participating in video conferences (41%) than webinars (29%).

- **There is a strong demand for training in technology across the workforces** — and in particular from social care staff. The strongest demand for training is in:
  - Using technology to support service users/clients/patients to access and use health and social care resources (48%), with people working in social care being particularly keen to access training in this (67%).
  - Using technology to support making decisions in frontline practice (42%); again with people working in social care being particularly keen (59%).

- **Almost one quarter (22%) of all respondents want training in the basics of using computers** (e.g. word processing, emails, spreadsheets); with 30% of all staff working in social care and 27% of all staff working in health wanting basic training.
5  A Core Capability Framework

The rapid literature review identified a limited range of individual capabilities for using technology to support service improvement, integration and transformation, despite noting the significant impacts that developing technology is having – and is likely to have – on the provision of health and social care. Those capabilities that were identified related mainly to telehealthcare/assistive technology:

- Knowledge of the range of technology available.
- Skills in matching equipment to users’ needs and home environment.
- Effectively managing technology.
- Fostering privacy and confidentiality.
- Demonstrating video “presence”.
- Understanding the importance of both acknowledging and responding appropriately to any technical difficulties that arise with the video-conferencing technology.
- Working with telehealth coordinators.

The importance of communication and social skills was emphasised (Wigfield et al 2013) as well as technical and IT skills, notably:

- Listening and communicating effectively with service users.
- Knowledge and skills to promote independence.
- Demonstrating sensitivity to the client’s cultural context.

The literature review also emphasised the need for digital literacy encompassing the following areas of competence – for which there are existing internationally recognised comprehensive competence frameworks (Ferrari 2012):

- Information management: ability to identify, locate, access, retrieve, store and organise information.
- Collaboration: ability to link with others, participate in online networks and communities; interact constructively.
- Communication and sharing: communicate through online tools, taking into account privacy, safety and netiquette.
- Creation of content and knowledge: integrate and re-elaborate previous knowledge and content; construct new knowledge.
- Ethics and responsibility: behave in an ethical and responsible way, aware of legal frameworks.
- Evaluation and problem-solving: identify digital needs, solve problems through digital means; assess the information retrieved.
- Technical operations: use technology and media, perform tasks through digital tools.

The review of relevant existing frameworks showed that detailed capabilities/competencies in telehealth/telecare/assistive technologies have been developed in several ‘frameworks’. However, there is significantly less work to identify capabilities in relation to:

- Using technology to share information for integrated and person-centred care.
- Using technology to support shared decision-making and self-management.
- Using technology in leadership and innovation.
It is proposed that a core capability framework for using technology to support the improvement and transformation of health and social services is developed which:

- Explicitly refers to the relevant existing frameworks, notably in relation to digital literacy and telehealth/telecare/assistive technologies.
- Focuses on the identification of capabilities in relation to the following areas/domains which are not as well developed in the relevant existing frameworks:
  - Using technology to share information for integrated person-centred care.
  - Using technology to support shared decision-making and self-management.
  - Using technology in leadership and innovation.
- Engages and consults with key stakeholders in the identification of detailed capability descriptors.

See table 1 for proposed domains for a core capability framework in technology-enabled learning; and table 2 for the existing frameworks mapped to the proposed framework, the capabilities identified in the rapid literature review and the baseline analysis.
Table 1: Proposed domains for a core capability framework in technology enabled health and social services

<table>
<thead>
<tr>
<th>Core capabilities for a technology enabled workforce</th>
<th>Should include</th>
<th>Should use existing frameworks</th>
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<tbody>
<tr>
<td>Foundational capabilities which are essential to the other four domains. It draws upon the principles of digital literacy, Information literacy and media literacy, infused by the principles of “learning how to learn”, critical thinking and problem-solving.</td>
<td>• Principles of confidentiality and data protection</td>
<td></td>
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<td>• Internet safety and security</td>
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<tr>
<td>• The basics of using computers</td>
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<td>• Using online collaboration tools</td>
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<td>• Creating and publishing online content</td>
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<td>• Accessing online learning opportunities</td>
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<td>• Participating in video-conferences and webinars</td>
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<td>• Social networking</td>
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<td>• Use of search engines</td>
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<td>• Using online learning materials</td>
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<td>• Information management</td>
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<td>• Ethics and responsibility</td>
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<tr>
<td>Using technology to share information for integrated person-centred care</td>
<td>Knowledge of:</td>
<td>Some relevant capabilities identified in:</td>
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<tr>
<td></td>
<td>• Electronic health and care record structures;</td>
<td>• AMRC eHealth Competency Framework</td>
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<td>• Technical and information standards for data sharing</td>
<td>• Clinical eHealth toolkit</td>
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<td>• Core principles of information governance.</td>
<td>• SQA PDS in Telehealthcare</td>
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<td>Skills in:</td>
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<td>• Managing clinical records</td>
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<td>• Organising information through coding and classification;</td>
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<tr>
<td>• Basic data analysis techniques;</td>
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<tr>
<td>• Producing and interpreting data visualisation;</td>
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<tr>
<td>• Learning from data - generating intelligence for practice, population health and wellbeing and management.</td>
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<tr>
<td>Using technology to support shared decision-making and self-management</td>
<td>Knowledge and attitudes in relation to:</td>
<td>Some relevant capabilities identified in:</td>
</tr>
<tr>
<td></td>
<td>• Rights and values</td>
<td>• Electronic Assistive Technology (eAT) in Social Care</td>
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<tr>
<td></td>
<td>• Principles of person-centred and outcomes-focused care.</td>
<td>• Health &amp; Social Care professionals: Telehealthcare competency framework (draft)</td>
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<td></td>
<td>• Technology facilitating co-production and assets-based approaches; supporting self-management; supporting chronic and multiple conditions.</td>
<td>• Telehealthcare support staff: competency framework (draft)</td>
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<td>• Knowledge and skills to promote independence</td>
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<td>• Demonstrating sensitivity to the client’s cultural context</td>
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<td></td>
<td>• Recognises the role of the family and carer in the provision of support and care to the individual.</td>
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<tr>
<td>Delivering care and support through telehealth and telecare technologies including assistive technologies</td>
<td>Knowledge and understanding of:</td>
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</table>
| • The scope of telehealth, telecare and assistive technologies; | • SQA PDA in Telehealthcare  
• Electronic Assistive Technology (eAT) in Social Care  
• Health & Social Care professionals: Telehealthcare competency framework (draft)  
• Telehealcare support staff: competency framework (draft) |
| • Current and future state of telehealthcare technologies; | |
| • The evidence base for telehealth and telecare | |
| • Health and safety issues. | |
| Knowledge and attitudes in relation to | |
| • Application of values and principles in telehealthcare – human rights, dignity and autonomy; communication | |
| Skills in: | |
| • Assessing and weighing up options for use of telehealth and telecare technologies as opposed to other approaches. | |
| • Deploying one or more telehealth technologies to deliver care and support in practice. | |

<table>
<thead>
<tr>
<th>Using technology in leadership and innovation</th>
<th>Knowledge, attitudes and skills in</th>
</tr>
</thead>
</table>
| • Using information and technology to support organisational change and transformation; | Some relevant capabilities identified in:  
• AMRC eHealth Competency Framework |
| • Distributed and adaptive leadership | |
| • Entrepreneurship and innovation in use of technology to help deliver new models of care. | |
Table 2: Frameworks mapped to capabilities identified in the rapid literature review and the baseline analysis.

<table>
<thead>
<tr>
<th>Potential core capabilities for a technology-enabled workforce</th>
<th>Areas identified through the baseline analysis</th>
<th>Capabilities identified through the literature review</th>
<th>eHealth Competency Framework</th>
<th>Clinical eHealth Toolkit</th>
<th>SQA PDA in Telehealthcare</th>
<th>Electronic Assistive Technology (eAT) in Social Care</th>
<th>Health &amp; Social Care professionals: Telehealthcare competency framework</th>
<th>Telehealthcare support staff: competency framework</th>
</tr>
</thead>
<tbody>
<tr>
<td>Learning capabilities for the digital age (underpinning domain)</td>
<td>• Using the web • Principles of confidentiality and data protection • Internet safety and security • The basics of using computers • Using online collaboration tools • Creating and publishing online content • Accessing online learning opportunities • Participating in video-conferences and webinars</td>
<td>• Information management • Collaboration • Communication and sharing • Creation of content and knowledge • Ethics and responsibility • Evaluation and problem-solving • Technical operations</td>
<td>• Working with information • Knowledge management • Clinical and health IT standards</td>
<td>• Knowledge management</td>
<td>• Confidence in technology</td>
<td>•</td>
<td>•</td>
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</tr>
<tr>
<td>Using technology to share information for integrated and person-centred care</td>
<td>•</td>
<td>• Managing relevant paperwork</td>
<td>• Clinical care records</td>
<td>• eHealth tools • eHealth skills</td>
<td>• Communicate with and complete records for individuals</td>
<td>•</td>
<td>•</td>
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<tr>
<td>Using technology to support shared decision-making and self-management</td>
<td>• Using technology to support making decisions in frontline practice • Using technology to support service users/clients/patients to access and use health and social care resources</td>
<td>• Listen &amp; communicate effectively with service users • Knowledge and skills to promote independence • Demonstrating sensitivity to the client’s cultural context</td>
<td>•</td>
<td>•</td>
<td>• Rights, values and eAT</td>
<td>•</td>
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</table>

• Work with service users to ensure the service meets their needs, in line with relevant standards and codes of practice, using a person-centred approach.
• Recognises the role of the family and carer in the provision of support and care to the individual.
<table>
<thead>
<tr>
<th>Potential core capabilities for a technology-enabled workforce</th>
<th>Areas identified through the baseline analysis</th>
<th>Capabilities identified through the literature review</th>
<th>eHealth Competency Framework</th>
<th>Clinical eHealth Toolkit</th>
<th>SQA PDA in Telehealthcare</th>
<th>Electronic Assistive Technology (eAT) in Social Care</th>
<th>Health &amp; Social Care professionals: Telehealthcare competency framework</th>
<th>Telehealcare support staff: competency framework</th>
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</thead>
<tbody>
<tr>
<td>Delivering care and support through telehealth and telecare technologies including assistive technologies</td>
<td>• Using assistive technologies</td>
<td>• Knowledge of the range of technology available</td>
<td>• Support the health safety of yourself and individuals</td>
<td>• Sourcing eAT</td>
<td>• Demonstrate knowledge base required for role in, and how it impacts on, telehealthcare service delivery</td>
<td>• Demonstrate knowledge based required for role and the impact on service delivery</td>
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</tr>
<tr>
<td></td>
<td></td>
<td>• Skills in matching equipment to users’ needs and home environment</td>
<td>• Ensure your own actions support the care, protection and well-being of individuals</td>
<td>• Assessment and review in relation to eAT</td>
<td>• Safe installation, maintenance and disposal of eAT</td>
<td>• Undertake practice taking into account legal and ethical issues relating to telehealthcare</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Effectively managing technology</td>
<td>• Relate to, and interact with, individuals</td>
<td>• Safe installation, maintenance and disposal of eAT</td>
<td>• Understanding of how telehealthcare services fit into overall service delivery plan</td>
<td>• Recognise the importance of keeping up to date with the processes and service developments to maintain and improve competence.</td>
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<tr>
<td></td>
<td></td>
<td>• Fostering privacy and confidentiality</td>
<td>• Ensure that your own actions support the equality, diversity and rights and responsibilities of individuals</td>
<td>• Remote or virtual monitoring and response systems</td>
<td>• Undertake practice taking into account legal and ethical issues relating to telehealthcare</td>
<td>• Demonstrate a commitment to the need for continuing personal development in order to enhance knowledge, skills, values and attitudes needed for safe and effective practice.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Demonstrating video “presence”</td>
<td></td>
<td>• Clinical IT systems and technologies</td>
<td>• Remote or virtual monitoring and response systems</td>
<td>• Understand the potential of telehealthcare</td>
<td>• Communicate effectively using a range of methods in relation to sensory, physical and cognitive needs</td>
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</tr>
<tr>
<td></td>
<td></td>
<td>• Understanding the importance of both acknowledging and responding appropriately to any technical difficulties that arise with the video-conferencing technology.</td>
<td></td>
<td></td>
<td>• Provide information and advice as the first point of contact for users</td>
<td>• Provide information and advice as the first point of contact for users</td>
<td>• Complain, compliments &amp; suggestions</td>
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<tr>
<td></td>
<td></td>
<td>• Working with telehealth coordinators</td>
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<td></td>
<td>• Communicate effectively using a wide range of methods</td>
<td>• Communicate effectively using a wide range of methods</td>
<td>• Telephone Management</td>
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</tr>
</tbody>
</table>

SMCI Associates, 9 York Road, North Berwick, East Lothian, EH39 4LX, Scotland  
t: 01620 895819 f: 01620 895819 e: info@smciassociates.com w: www.smciassociates.com
<table>
<thead>
<tr>
<th>services provided</th>
</tr>
</thead>
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<tr>
<td>• Recognise importance of informed consent</td>
</tr>
<tr>
<td>• Providing a safe and secure environment for telehealthcare in practice</td>
</tr>
<tr>
<td>• Communicate effectively using technologies to deliver &amp; support services</td>
</tr>
<tr>
<td>• Report equipment failure appropriately</td>
</tr>
<tr>
<td>• Knowledge of local policy and procedure for dealing with complaint</td>
</tr>
<tr>
<td>• Adherence to information governance standards when dealing with patient/client data.</td>
</tr>
<tr>
<td>• Ability to operate equipment as required by role</td>
</tr>
<tr>
<td>• Maintaining confidentiality</td>
</tr>
<tr>
<td>• Assessment for telehealthcare services</td>
</tr>
<tr>
<td>• Learning and Development</td>
</tr>
<tr>
<td>• Demonstrate progress of self-development through reflective practice</td>
</tr>
<tr>
<td>• Training</td>
</tr>
<tr>
<td>• Disaster Recovery</td>
</tr>
<tr>
<td>• Lone Working</td>
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<tr>
<td>• Carry out Administration procedures</td>
</tr>
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<td><strong>Potential core capabilities for a technology-enabled workforce</strong></td>
</tr>
<tr>
<td>---</td>
</tr>
<tr>
<td>Using technology in leadership and innovation</td>
</tr>
</tbody>
</table>

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Appendix A: Search strategy

This was a time-limited rapid review, focusing on workforce capabilities in technology: organisational capabilities (eg C&IT infrastructure) were not within scope.

5.1 May-June 2014 search

The following databases were searched via The University of Edinburgh during May/June 2014:
- Google Scholar
- Web of Science

5.1.1 Google Scholar results

A wide range of search terms were entered into Google Scholar in an attempt to identify an appropriate combination of words that would tap into literature addressing the development of TEL capabilities. The searches were limited to items published from 2009 onwards. The search terms varied widely in terms of the number of results they prompted, ranging from 1 result-100,000+ results. In the cases where search terms resulted in more than 100 results, a pragmatic decision was taken to scan the first 10 pages of results. The search terms used are presented below, grouped according to the number of results they yielded.

1-25 results
- “technology-enabled learning” AND “systematic review”
- "technology enabled learning" AND "competency framework"
- "technology enabled learning" AND "capability framework"
- “workforce capability framework” AND elearning
- “technology enabled learning” AND "healthcare workforce"
- "e-learning readiness" AND "systematic review"
- “digital competence” AND “healthcare workers”
- “digital skills” and “healthcare workers”
- “telehealthcare” AND “competency framework”

26-100 results
- “technology enabled learning” AND “healthcare”
- “ICT skills” AND “healthcare workers”
- “digital capability” AND healthcare

101-1000 results
- "technology enabled learning" AND "workforce"
- “workforce capability” AND "technology enabled learning"
- “Digital capability”
- “e-learning” AND “healthcare workers”
Very few of the search terms used within Google Scholar yielded any results that were sufficiently relevant to the topic of TEL capabilities that they could be incorporated into the literature review. Indeed, only one academic paper retrieved via Google Scholar searching was deemed suitable for inclusion in this review (Petty, 2013, retrieved using the search terms “technology enabled learning” AND “workforce”). This suggests that there is very little available literature on the topic of TEL capabilities. What the Google searching did uncover was a range of academic papers and grey literature research reports on the overlapping topics of digital competence and digital literacy. A number of competency frameworks relating to digital competence/literacy were retrieved. Full analysis of these frameworks is outside the scope of this review. However, in section 2.5, this review does summarise the findings of a research report that presents an analysis of 15 digital competence frameworks (Ferrari, 2012, retrieved using the search terms “technology enabled learning” AND “competency framework”). Ferrari’s report is included in the TEL review because the theme of digital competence incorporates a number of concepts that may be applicable to the development of a TEL capability framework. Thus, Google Scholar searching resulted in two research reports selected for inclusion in the review (Ferrari, 2012; Petty, 2013).

5.1.2 Web of Science

After consideration of the search results obtained via Google Scholar, and in consultation with NES, the following title search terms were used:

- Technology-enabled learning
- “technology-enabled learning” AND (telehealth* OR telecare)
- telehealth* OR telecare
- ehealth* or e-health*
- (elearning or e-learning) AND “healthcare work*

Inclusion criteria:

a) Review articles, selected due to the very limited timescale for conducting the review.

However, due to the small number of articles retrieved on this basis, the searches were
expanded to include non-review articles. Ultimately, expanding searches to include non-review articles led to the inclusion of only one non-review article.

b) Articles published in English
c) Articles published between 2009-2014

Initial searching resulted in 853 records which met inclusion criteria a), b) and c). Titles and abstracts of initial search results were scanned for relevance and excluded if they did not appear to focus upon individual capabilities for TEL. As a result of this process, 821 references were excluded, and the 32 remaining references were imported into EndNote. Full text versions of each of the 32 marked list articles were examined in greater detail (with the exception of 2 references which the reviewer was unable to access) to assess whether they were suitable for inclusion in the review. One of these papers had already been retrieved via the Google Scholar search (Petty, 2013), and so was removed.

Close reading of the 31 remaining articles led to the exclusion of 29 papers on the grounds that their central focus was on aspects of telehealth, telecare or ehealth unconnected to workforce capabilities. Neither of the 2 remaining papers was related to research specifically about individual capabilities for using TEL to support service improvement, integration and transformation. However, they were included in the review because they offered evidence or discussion about one or more dimensions of health or social care workers’ experiences of using technology either for their own learning or to support service delivery.

5.1.3 Intermediate literature search results

To summarise, two references were retrieved via Google Scholar searching, and two references were retrieved through Web of Science searches. A further 5 references, including 2 “grey literature” reports, were retrieved through citation searches and through scanning reference lists of published articles found in the initial database searches. Thus, in total, 9 references were selected for inclusion in this review. In light of the relatively small number of publications selected for review, each of the 9 references are summarised in the following section.

5.2 Follow-up literature searches

Subsequently, in November 2014, and in consultation with NES, the following bibliographic databases were searched:
- MEDLINE,
- CINAHL

And in December 2014, Social Science Abstracts and ASSIA were searched.

All databases were searched through The Knowledge Network14, using the following limiters:
- All search terms
- English language

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14 http://www.knowledge.scot.nhs.uk/home.aspx
• Within the last three years (ie 2011 – 2014), recognising that more current papers will reference earlier papers.
• Full text, recognising that abstract only availability would not provide the level of detailed needed to inform the development of a TEL capability framework for the health and social care workforces in Scotland.

Tables 3 and 4 detail the results for the search terms were used, agreed with NES. It must be reiterated that the focus of the search was on the identification of specific workforce (ie staff) TEL capabilities/competencies to inform the development of a TEL capability framework for health and social care workforces in Scotland; rather than research that points to the need for staff to have technological/ICT/digital capabilities in general.

Two other references in the grey literature, both relating to research undertaken by Skills for Care, and published in July 2014. This follow-up search supported the findings of the earlier search that there is very little literature on capabilities for technology enabled learning in the health and social care workforces – in any jurisdiction in the world.
<table>
<thead>
<tr>
<th>Concept 1</th>
<th>+ Concept 2</th>
<th>MEDLINE</th>
<th></th>
<th></th>
<th>CINAHL</th>
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</tbody>
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\(^{15}\) Courtney-Platt et al 2012; Lin 2011
\(^{16}\) Malloch & Mazurek 2013
**Table 4: Second follow-up literature search results**

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Appendix B: Project Steering Group

Nessa Barry, Service Development Manager, Scottish Centre for Telehealth & Telecare NHS 24

Dr Sheila Inglis, Director, SMCI Associates

Mairi-Anne MacDonald, Director of Sector Development and Registrar, Scottish Social Services Council

Pam Nicoll, Programme Director RRHEAL, NHS Education for Scotland

Keith Quinn, Senior Workforce Development and Planning Adviser, Scottish Social Services Council

Frances Scott, Workforce Development and Planning Manager, Scottish Social Services Council

Dr Ann Wales, Programme Director for Knowledge Management, NHS Education for Scotland