

Harnessing digital technologies for workforce development, education and training: an overview



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Foreword



Expanding on the legacy of the *Topol Review*, chaired by digital leader, cardiologist, and geneticist Professor Eric Topol, for which I had the pleasure to be the Senior Responsible Officer, this report delves deeper into preparing the healthcare workforce to deliver the digital future. It explores the themes of how digital is harnessed to develop a continuous learning environment, enable new ways of working, and ensure the NHS workforce is digitally ready.

Since Topol was published in February 2019, we are now seeing, for instance:

- the vast [majority of GPs](#) have a digital offer to patients, including online consultations, online prescriptions, and online appointment booking
- the [NHS app](#) is the most downloaded free app in England, with over 16m users
- AI is now routinely used in diagnostics
- large scale [genomics surveillance](#) is in place, offering novel means to detect SARS-CoV-2 variants

We give you a flavour of the important work Health Education England (HEE) is doing and share current thinking on how health and social care might be transformed using digital technologies. This includes developing the necessary culture, design, delivery and content for education and training, to best support the current and future health and care workforce to deliver the best care for all.

Patrick Mitchell,
Director of Innovation, Digital and Transformation

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Introduction

This paper shines a light on how the [Directorate of Innovation, Digital and Transformation](#) is making a difference now, re-shaping the world of education, training and workforce redesign, putting in place the building blocks which will enable the system to solve its wicked problems. It is helping to build digital capability, maximising the benefits of new technologies, developing a culture of 'digital first'. HEE uses its national role to draw on the latest thinking, evidence, and knowledge to spread learning and intervene at pace and scale.

The profile of the health and care workforce needs to change significantly to meet demand, enabling the delivery of services in a digitally enabled environment. It is predicted that “in the next decade the [NHS workforce](#) needs to grow twice as fast and the social care workforce four times as fast as in the previous decade to meet demand.” More than [50% of today's workforce](#) will still be working in 2032. Policy makers and leaders need to maximise digital technologies to:

- take a system-wide approach to workforce planning and supply
- transform the delivery of education and training
- upskill the existing workforce
- inform clinical decision-making
- design and deliver personalised healthcare services

Ways of working also need to be transformed. The [Interim NHS People Plan](#) predicts that “work will be much more multidisciplinary, people will be able to have less linear careers, and technology will enable our people to work to their full potential as tasks are automated. Improved technology will also mean that services are organised and delivered more efficiently.”

Working with partners, the Directorate takes a leading role in cross-system workforce planning, shaping future health and social care workforce strategy. The ambition of our work is captured in these five inter-related areas:

- [Delivering workforce provision, education and training](#)
- [Implementing digital tools and practices to support the NHS to manage workforce transformation, planning and lifelong learning](#)
- [Mobilising evidence and knowledge](#)
- [Creating learning platforms, curricula and ecosystems to widen access to education and training](#)
- [Evolution of culture and environment as key enablers of digital transformation](#)

1. Delivering workforce provision, education and training

NHS staff and learners, facing new public health emergencies such as COVID-19, need to act quickly and learn to adapt as the situation changes. This includes learning about health risks to specific populations, new medicines, technologies, and interventions. Yet time is at a premium for hard pressed clinical staff. As the *Topol Review* highlights, a wide variety of digital education and training methods can support the workforce in these rapidly changing times.

1.1 Simulation, immersive and learning technologies to meet the changing needs of health and care professionals throughout their careers

HEE is developing simulation education including faculty development programmes and support for simulation technician roles. Programmes are in place to improve access to technologies and evaluate the growing number of learning systems available, offering quality assurance and guidance to inform investment decisions. Using simulation together with immersive technology, artificial intelligence (AI), and haptic robotic technologies, have the potential to replicate the clinical environment and interaction with patients, enabling more efficient up-skilling and rapid competence acquisition.

1.2 Blended learning approaches to address workforce gaps and to improve educational experience for students

HEE has worked with partners to develop a procurement framework, for continuing professional development (CPD) training. This has led to the recent procurement of the blended learning critical care training which has yielded potential savings upwards of £24m for the system. This mix of online, digital, and face-to-face learning approaches has been shown to improve the educational experience for students – not only is it pedagogically sound, but it also reduces attrition and improves learning retention and critical thinking. The approach strongly supports widening access and participation into health education and careers.

1.3 Encouraging the scale and spread of innovation and the adoption of best practice, using the latest digital approaches

HEE has created the Virtual and Hybrid Learning Faculty to develop and inspire educators within the health and social care education community to deliver blended learning programmes. Over the next two years this community will work with HEE to ensure blended learning programmes are building the current and future competencies required, taking into consideration revalidation and CPD. HEE will continue to work with regulators to provide assurance that the use of simulation and innovative technologies through blended learning deliver the skills required for practice throughout the system.

2. Implementing digital tools and practices to support the NHS to manage workforce transformation, planning and lifelong learning

To support better clinical decision-making, healthcare professionals must undertake life-long learning. As digital and AI technologies transform work, there is an opportunity to use digital tools to enhance lifelong learning and access to knowledge. HEE is working with partners to support individuals to manage their lifelong learning and to support systems with [workforce transformation](#), joining up data from multiple systems and using AI to revolutionise the way health and social care manages learning, whilst driving down costs.

2.1 Connecting people to self-service tools supporting career planning and learning to optimise skills in real time

HEE works with partners to manage systems supporting recruitment, career planning, learning and accreditation: Oriel, a UK wide portal for recruitment to postgraduate medical dental, public health, healthcare science and pre-registration pharmacy training; HEE's [Trainee Information System \(TIS\)](#) for the management and administration of trainees and learners; HEE's [Digital Skills Assessment Tool \(DSAT\)](#) enabling individuals to self-assess their digital skills and be signposted to relevant resources and learning. A competence-based approach is key to addressing workforce capability gaps, HEE's technology enhanced learning (TEL) platforms supports the assessment of all competencies via the NHS [Digital Learning Solutions \(DLS\) service](#).

2.2 Support for staff delivering healthcare services to explore workforce challenges and develop plans to address them

The national [Clinically Led Workforce and Activity Redesign \(CLEAR\)](#) programme trains frontline clinicians in data analysis and service modelling to deliver change. CLEAR offers individuals and organisations the opportunity to investigate systems and services using a unique methodology, placing service transformation in the hands of those delivering care.

2.3 Develop AI-enabled digital passporting and life-long learning records

HEE is working with partners to develop a lifelong learning portfolio as a first step to the creation of a "passport" where individuals own and maintain their training records, enabling them to share these with any future employer, facilitating movement of staff between organisations. The NHS [Learning Hub](#) will act as a key part of this system enabling data profiles to be compared and matched to meet service needs and to develop contextualised just-in-time adaptive and personalised learning.

3. Mobilising evidence and knowledge

Digital skills and infrastructure are critical to enable the use of reliable evidence and knowledge to underpin high-quality healthcare. HEE's strategy, [Knowledge for Healthcare 2021-2026](#) envisions that: "NHS bodies, their staff, learners, patients and the public use the right knowledge and evidence, at the right time, in the right place, enabling high quality decision-making, learning, research and innovation, to achieve excellent healthcare and health improvement."

The core value proposition for NHS knowledge and library services in England is simple: "The service provides healthcare professional staff with time-saving accelerated access to better quality evidence which, in turn, enables the NHS to meet its statutory obligations to utilise evidence from research, and, as importantly, for healthcare professionals to use their time more effectively to drive improvements against the quadruple aim."

An [independent study commissioned](#) by HEE found knowledge services already generate an overall economic benefit of £132m each year, delivering a net economic benefit of £77m. This could increase to £106m each year were target staff ratios achieved.

HEE's in-house Knowledge Management Service Team use their expertise to take the 'heavy lifting' out of getting evidence into practice, and give the 'gift of time' to colleagues, enable evidence-informed policy and practice by regional and national teams. The team manage corporate knowledge, share case studies of best practice, and facilitate staff to share their 'know-how.'

3.1 Expanding and promoting the national [NHS Knowledge and Library Hub](#)

Launched in January 2022 this national gateway provides seamless access to a significant range of NHS-funded and curated digital knowledge resources. Within the next five years the search functionality will be augmented with AI-based automated evidence synthesis tools to both save time and enrich knowledge retrieval.

3.2 Embedding the use of clinical decision support

HEE provides a guidelines-based clinical decision support tool, [BMJ Best Practice](#), for all staff and learners in England. This delivers evidence summaries and evidence-based patient information leaflets, 24/7, by app and online. HEE encourages NHS Trusts to embed BMJ Best Practice into the electronic patient record.



3.3 Promoting digital tools to help the NHS maximise knowledge as an asset

HEE's digital [Knowledge Mobilisation Self-Assessment Tool](#) enables healthcare organisations to quickly assess opportunities develop as a learning organisation, making best use of evidence and optimise corporate knowledge as an asset.

The [NHS Knowledge Mobilisation Framework](#) equips health and care teams to capture and share staff know-how and organisational knowledge. HEE is developing online CPD for the health and care workforce to gain skills in knowledge mobilisation.

3.4 Working with partners to maximise use of digital knowledge resources

Underpinned by a [Concordat](#) between arm's-length bodies, HEE brings partners together with a strategic focus on collaboration to maximise digital knowledge resources for health and care, and drive evidence informed decision-making.

3.5 Learning health systems

Learning Health Systems capture data from practice, generate knowledge from this and put it into practice to improve care. HEE is exploring how to use the [Learning Health System Framework](#), which requires digital and knowledge management skills.

4. Creating learning platforms, curricula and ecosystems to widen access to education and training

Digital learning platforms are disrupting traditional education and training models, which were based on instructors and learners being physically in the same place. A digital platform approach means each learner has equitable access to high quality products to help them through their education experience, irrespective of time and place.

4.1 Creating one core learning platform

[The Learning Hub](#) has been developed by HEE's TEL team to combine the existing eLearning for healthcare (elfh) and Digital Learning Solutions, plus additional community-sourced learning content, to become one of the biggest services of its kind in the world. Through TEL platforms we are currently supporting more than two million learners, providing simple, seamless to access learning and development for the entire workforce at a time and place to suit them.

4.2 Fostering a collaborative, trusted ecosystem of digital curricula and content

Promotion of content development partnerships continues, building on the marketplace initially established for TEL's eLearning for healthcare (elfh). This includes access to over 500 programmes, with 50-100 new programmes added per year. HEE TEL's [Digital Learning Solutions](#) provides access to eLearning for the development of IT skills in over 300 NHS organisations and delivers the [Digital Skills Assessment Tool \(DSAT\)](#). The [Digital Readiness Education programme](#) is establishing a suite of new learning content to support the workforce in developing digital skills.

4.3 Establishing and integrating agreed quality, competency and evidence-based frameworks to achieve a digital first environment

HEE is currently supporting activities to develop competency-based assessment and learning. Competencies are important in achieving standards in order to define job roles, to develop learning, to build education and training programmes and to help individuals to manage their own learning pathway.

The TEL Readiness and Maturity Service programme targets the barriers to enabling education and training through digital technologies. It provides assurance that digital competency and capability are considered prior to participating on HEE's Extended Reality (XR) Hub service. By providing a pool of specialist expertise and resources the HEE team enables a levelling-up within the system and supports the healthcare workforce to maximise the benefits of these digital solutions.



4.4 Creating an environment to improve health and digital literacy for citizens and the workforce

43% of adults aged 16-65 in England struggle with words-based healthcare information, rising to 61% when numbers are added. These “health literacy” levels vary by locality and HEE funded the University of Southampton to analyse [health literacy geodata](#), to help NHS organisations to prioritise action.

HEE’s knowledge and library services team leads a [Health and Digital Literacy Compact](#) with CILIP (the library and information association), Arts Council England and Libraries Connected (the lead body for public libraries) to equip information providers in community settings with the training and resources to increase the health literacy and digital literacy skills of citizens.

5. Evolution of culture as a key enabler of digital transformation

The increasing use of digital enablers requires a shift in mindset, behaviour, and a requirement for lifelong learning. It also needs collaboration across systems to create an environment where digital solutions can flourish. HEE's commitment to a 'Digital First' culture involves: "deeply caring about delivering better services to our customers, proving it and having the right capability, culture and technology to do it well."

5.1 Expanding our community of digital leaders

HEE is committed to expanding the community of digital leaders across health and social care, as well as supporting the development of the specialist digital workforce. The HEE [Digital Readiness Education programme](#) has established the [NHS Digital Academy](#) providing a suite of learning products that support the needs of both digital experts (circa 46,000 in the NHS) and those who require digital knowledge and expertise, for example, clinicians who have been asked to support digital change programmes.

The Academy's flagship [Digital Health Leadership programme](#) has supported the development of over 500 digital change leaders across health and care. HEE is expanding the Academy to incorporate learning programmes, resources, and tools to extend its reach to a broader range of individuals across the workforce.

5.2 Supporting senior leaders to understand the power of digital

For leaders, digital readiness is the ability to get the balance between governance and innovation right, enabling change safely and at pace. HEE has commissioned NHS Providers to deliver a [Digital Boards programme](#) for Trust boards. This has engaged over 1,700 Trust board members from 200 Trusts; delivered more than 70 Trust sessions with more scheduled through 2022 and beyond. This activity is being extended to Integrated Care Boards.

5.3 Building confidence and a culture of 'normality' around digital usage

Research within the NHS AI Lab has developed a conceptual framework for developing appropriate levels of confidence in AI technologies within the healthcare workforce, suggesting educational pathways to inform education and training offers.

Evidence-based frameworks and tools in development include the Digital Skills Assessment Tool (DSAT), underpinned by a digital capability framework, and the AI and Digital Healthcare Technology Capability Framework. The [Digital, AI and Robotics Technologies in Education \(DART-Ed\) programme](#) is working in partnership with Unity Insights, building on work in Kent Surrey and Sussex Academic Health Science Network to deliver an [AI Roadmap](#).

This will analyse the impact of AI and data-driven technologies on the workforce and build the evidence base required for successful spread and adoption.

5.4 Creating region wide networks of digital health professionals accessing quality learning and education

Informatics Skills Development Networks (ISDNs) have been established across all regions in England as well as a National Coordination and Advisory Group with a Chief Information Officer (CIO) Chair to help them maximise their impact. ISDNs enable the linking-up and acceleration of professionalism, effectiveness, and expertise of CIOs, Chief Clinical Information Officers (CCIOs) and Chief Nursing Information Officers (CNIOs) and their teams.



6. Conclusion

HEE's rich portfolio of work is already demonstrating impact, helping to establish a whole learning healthcare system where the culture enables the benefits of digital technologies to be harnessed. This is driving a step change in the way education and training; workforce transformation and mobilisation of knowledge and evidence takes place. This impacts all current and future health and care staff, educators and learners involved in the planning and delivery of health and care.

The work explores new ways of delivering learning which rely upon digital technologies. The use of simulation and blended learning approaches are improving the educational experience, supporting behaviour change, reducing course attrition, improving learning and retention, and enabling critical thinking. This enables flexibility and encourages multidisciplinary learning which in turn positively impacts team dynamics, human factors training, and patient safety.

New tools to mobilise evidence and knowledge at the right time and in the right place enable high quality decision-making, learning, research, and innovation, while at the same time giving health and care staff back the gift of time.

In the workforce redesign space, a focus on the use, recording and measurement of skills and capabilities, will help organisations to leverage their workforce by optimising the skills that they have available to them. It will also support collaboration with the education sector to produce the new skills required to fill gaps.

Evolution of culture and environment are key enablers of digital transformation. Working with health and care leaders to provide horizon scanning, assess learning needs and deliver education helps to develop a culture which not only enables digital transformation but also maximises the potential of digital technologies.

As HEE joins NHS England, the team will continue to take a proactive interventionalist approach, nurturing and facilitating the system to adopt technological solutions to address health and care challenges and applying technological approaches to workforce design, education, and training to ensure no-one flounders, fails, or falls behind.

This is the work of the dedicated teams of Technology Enhanced Learning, the Knowledge and Library Service, Blended Learning, Workforce Transformation and the NHS Digital Academy around bringing their expertise together and whose next steps are:

- To continue to work with our wide range of partners to codesign solutions to meet the Government's productivity agenda and the aspirations laid out in the NHS Long Term Plan. This includes modifying and adapting the work as appropriate to fit with new models of care and delivery as required by Integrated Care Boards.

- To promote evidence-based investments and commissions to harness digital technologies to deliver education and training, mobilise knowledge and evidence, and transform our workforce. These are having an immediate effect and form a solid base upon which to build.
- To continue to seek and act on feedback from our partners and service users, including students, trainees, and educators, to inform our approach to digital transformation and remain even more customer focussed on the delivery of education and training across England.
- To communicate and share thinking and products openly, in order that as many organisations as possible become aware of this work and share these ambitions – in England, other devolved nations, and abroad.

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