

# Theory of Change: A Tool for Engaging the Health and Care Workforce in Developing Digital Skills

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**Abstract.** The health and social care sector has experienced an optimistic turn in the last decade. There has been substantial growth in recent years due to the COVID-19 pandemic that forced the entire sector to identify digital methods of delivering a better level of care than before the pandemic. This paper used the Theory to Change (ToC) approach to demonstrate how the digital skills development of the health and care workforce can be achieved in specific contexts. The paper offers background on digital technologies used in healthcare and outlines the steps and methods used in developing a ToC map. The impact of the proposed ToC approach provides a measurable and predictable way to onboard the health and social care workforce into digital technologies, providing a more digitally skilled and literate workforce.

**Keywords.** Theory of Change, health and care workforce, digital skills

## 1. Introduction

The advances in technology and digital health have triggered the need to educate the health and care workforce to engage the technological developments. For example, clinicians should be aware that the data derived from electronic health records (EHR) and personal health records (PHR) are being exploited with AI, genomics and data analytics for diagnosis, precision medicine and other patient care improvements [1]. Hence, to deliver quality care to patients/citizens with these everchanging technologies, the evolving health and social care workforce requires relevant digital skills and confidence. This paper presents Theory of Change (ToC) as a tool that articulates how the impact of digital education on the health and care workforce can be implemented, tracked and measured. UK's Department for International Development (DFID) defines ToC as “an outcomes-based approach which applies critical thinking to the design, implementation and evaluation of initiatives and programmes intended to support change in their contexts” [2]. The ToC approach works backwards from a long-term change to the inputs and mediating components required to achieve the change [2]. ToC is known in international development. However, it has started to gain traction in health

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informatics [3]. Now, it can be used as a planning and evaluation tool in developing the digital health skills of the health and care workforce.

## 2. Methods

We used the ToC approach throughout the lifecycle of the implementation to demonstrate how the digital skills development of the health and care workforce can be achieved in a specific context. The ToC components used in this paper are described in Table 1.

**Table 1.** List of Theory of Change components and definitions

Component	Definition
<i>Long-term change</i>	The desired goal the stakeholders want to achieve.
<i>Problems</i>	The challenges necessitating the digital skills development of the health and care workforce as identified in the literature and expert experience.
<i>Stakeholders</i>	The people directly or indirectly involved or affected by the success or failure of the initiative.
<i>Assumptions</i>	The beliefs that specify the underlying reasons for the logical connections that exist between the ToC elements. These beliefs are usually informed by research evidence, clinical/care practice and the environment in which the change is taking place.
<i>Inputs</i>	The activities/tasks carried out around the intervention.
<i>Interventions</i>	The initiatives or programmes embarked on to influence the desired outcomes; in this paper, the digital skills development for the health and care workforce.
<i>Outputs</i>	The tangibles resulting from the inputs and the intervention.
<i>Measurable effects</i>	The immediate indicators that could be traced to the implementation process and are readily usable for evaluation. These measures can be quantitative or qualitative.
<i>Wider benefits</i>	The generalisable pointers that could guide the stakeholders as to how possible is the long-term change.

We developed the initial ToC map (Figure 1) as an actual ToC based on evidence from literature and expert experience. The ToC map illustrated the identified problems, the key stakeholders, assumptions, inputs, intervention, outputs, measurable effects and wider benefits of the intervention to realize the long-term change [4]. ToC is typically developed in versions (initial, revised and generic) to reflect the changes and realities from stakeholder engagements during implementation.

## 3. Results

We report the development of the ToC map (Figure 1) for developing digital skills of health and care workforce and the components.

### 3.1. Long-term change

The long-term goal of this ToC is to have a digitally skilled health and social care workforce to benefit the patients/citizens. The intervention, wider benefits and measurable impact feed into this long-term change.

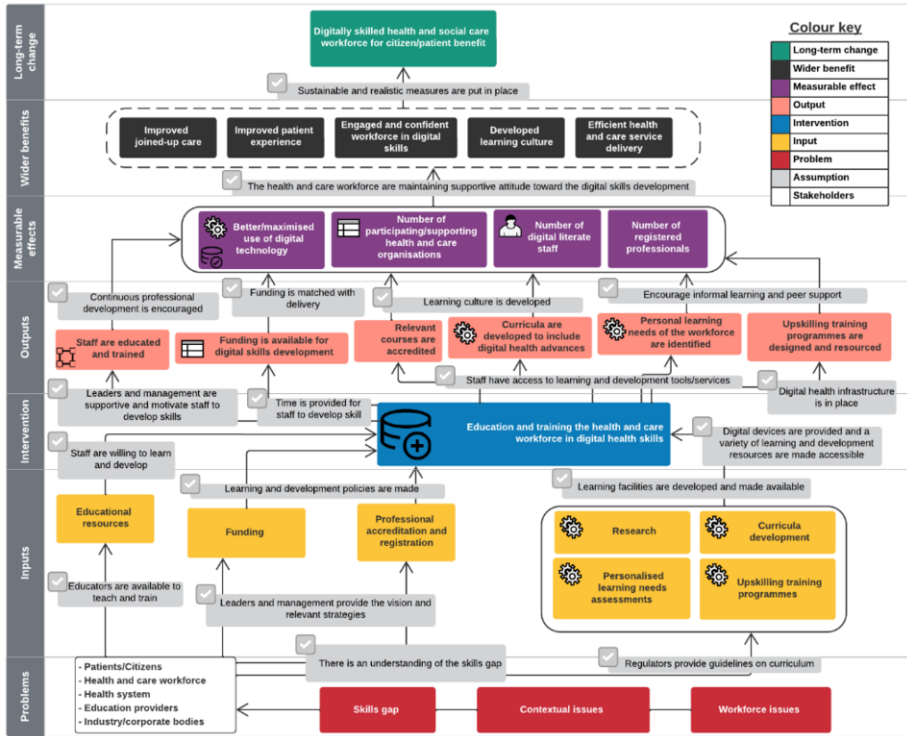


Figure 1. Theory of Change for developing digital skills of health and care workforce.

### 3.2. Wider benefits

The broader outcomes include improved joined-up care provision and patient experience. Patients will have a richer experience with the assistive technologies, which provide more efficiency and ensure less time spent on diagnoses, cures or management. The potential benefits of digital technologies cannot be fully realised without health professionals being adequately skilled in using them or the day-to-day work processes not adequately re-engineered to enable the technology to add value [4]. Other benefits include professional development of health and social care workforce and efficient service delivery.

### 3.3. Measurable effects

The number of digital literate staff and registered professionals are among the measurable effects. According to [1], 90% of all jobs in the NHS will require some element of digital skills within 20 years. Staff will need to be able to navigate a data-rich healthcare environment. This means that staff need digital and genomics literacy, hence influencing the number of digital literate staff. Digital technology is maximized in all the forms it affords health and social care workers, including but not limited to e-learning, social networking, access to information and blended learning [5].

### 3.4. *Outputs*

The expected outputs might include educated and trained staff. There will be more digitally literate staff by providing education and training resources on digital technologies. Funding is available for digital skills development, and relevant courses are accredited. The curricula are developed to include and reflect digital health advances [6]. Personal learning needs of the workforce are identified while upskilling training programmes are designed and resourced.

### 3.5. *Intervention*

The main intervention is the education and training of the health and care workforce in digital health skills. The intervention could entail a variety of specialist training (e.g. AI, genomics, data science/analytics or IT leadership), higher education (e.g. BSc, MSc or PhD), apprenticeships (e.g. college or degree apprenticeships), professional certification/registration and other continuous professional development (CPD) programmes.

### 3.6. *Input*

The inputs could include educational resources (e.g. lectures, HEE's e-learning for healthcare), accreditation/registration, research to inform educational/curriculum development), funding, upskilling training programmes (e.g. e-learning, textbooks, workshops, seminars, shadowing/observation and reading peer-reviewed journal articles) and personalized learning needs assessments.

### 3.7. *Problem*

The key challenges are skills gap (e.g. lack of clinical champions in digital skills), contextual issues (e.g. skills uptake, management buy-in, staff willingness, organisational readiness) and workforce issues (e.g. social care staff feeling undervalued or left out – digital exclusion, unattractive career pathways – social care staff, technical workforce in AI, data analytics, cyber security etc.).

### 3.8. *Stakeholders*

Patients and service users are at the heart of any innovative health and social care intervention. The health and care workforce needs to be involved in developing digital health skills to ensure success. Facilitators such as the health and social care system (e.g. the NHS, integrated care systems, health boards and care home management), education providers (e.g. academia (universities, colleges etc.), professional/statutory/regulatory bodies (e.g. FEDIP and member bodies, FCI, Health Education England, and NHS Digital Academy) and industry players are instrumental to the success of the digital skills development drive.

### 3.9. Assumptions

Assumptions are critical to the development of ToC because they serve as the ‘theories’ underpinning each ToC component. Sometimes, these assumptions can be challenging to test because they are usually generated from stakeholders’ views. However, the assumptions were mainly derived from peer-reviewed sources and published reports.

## 4. Discussion

ToC could be used as a learning and reflection tool that begins when stakeholders set a long-term goal and go in a reverse direction to specify assumptions and identify preconditions to bring about the desired outcomes [3]. ToC helps track and measure real-world social impact because the process clearly articulates how the intervention impacts the measurable outcomes, wider benefits and long-term change. ToC articulates what, why and how an intervention works to achieve the long-term change. It can be used to evaluate progress and lack thereof, but ToC may lack the full details required for the change. Nonetheless, ToC could be used to provoke thoughts and interactions around the mechanisms of the proposed change. This first ToC version was largely created from existing literature and the authors’ expertise; hence its components will need to be tested with stakeholders (health and care workforce) in real-world contexts. Also, subsequent versions will need to involve key stakeholders in the specific implementation context.

## 5. Conclusion

This paper presented ToC as a systematic tool that could be used to engage stakeholders at all levels in developing the digital skills necessary for the health and social care sector. Digital technologies have proven from literature to have the capacity to deliver quality healthcare to patients but not without the skilled human resource behind the technologies. Educating and training health and social care workers will go a long way in developing a digitally skilled workforce that will improve the delivery of health and care.

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