

# DEMOCRATISING eHEALTH DESIGN: EMPOWERING HEALTHCARE PROVIDERS WITH HEALTHCARE DESIGN ABILITIES THROUGH A CO-CREATION TRAINING

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## ABSTRACT

The market penetration of eHealth interventions is substantially lower than investors anticipated due to their low acceptance. Main causes include the use of top-down approaches and the tendency for research to concentrate on technology rather than service delivery from users' perspective. Healthcare professionals have exclusive expert knowledge of evidence-based practice in a specific area, which may explain why many eHealth intervention development projects continue to use top-down approaches. It is therefore crucial to empower healthcare professionals with design skills and mindset. On the other hand, the roles and responsibilities of designers in the twenty-first century have been controversial. Many farsighted designers assert that we are at a turning point of transforming design from an expert-driven process focused on objects and services within a taken-for-granted social and economic order towards design practices that advocates design-led societal transition toward more sustainable futures. To foster the transformation, design education should cater to all abilities. Health CASCADE is a Marie Skłodowska-Curie Innovative Training Network to consolidate co-creation as an effective tool to fight public health problems. Imparting the knowledge of co-creation in public health to healthcare professionals has the potential to alleviate the gap between design and healthcare, meanwhile provides opportunities for stakeholder participation in the development process to increase trust. This paper illustrates a curriculum development process partnered with a healthcare professional aiming for delivering knowledge of co-creation in public health to healthcare professionals working on designing eHealth programmes on the national healthcare support platform, 1177.se – Support and Treatment in Sweden.

*Keywords: eHealth, co-creation, healthcare professional*

## 1 INTRODUCTION

The burden on the healthcare system is growing as medical treatment advances, the aged population increases, and people's health awareness improves. eHealth is one of the prospective strategies to cope with this situation which has great potential to open up new avenues to the health system. Most recently, the COVID-19 pandemic has intensified the focus of the development of eHealth interventions [1], potentially due to quarantine policies and the large amount of health resources allocated to COVID prevention and treatment [2]. Despite tremendous progress, the development of eHealth interventions is fraught with difficulties. There is a paradox in that there are a variety of eHealth interventions accessible on the market, but their market penetration is now substantially lower than investors anticipated due to their low acceptance. It may result in a waste of effort and resources. The sustainable development of eHealth interventions can be categorised as one of the wicked problems in the twenty-first century as it is morally repugnant for the planner to address and has spread across the board [3]. Due to limited evidence on optimum leverage points, the waste is likely to endure. The reasons for the lagging development were identified in the following aspects. A) The use of top-down approaches and the tendency for research to concentrate on technology rather than service delivery from users' perspective are part of the main challenges for current eHealth intervention development projects [4]; B) eHealth is being mass-produced and its legality are being debated [5], which may undermine its original goal of

improving healthcare delivery by eroding user trust; C) as eHealth intervention development is available to developers without professional medical training, various studies have highlighted concerns regarding the quality of eHealth interventions and the medical information they contain [6]. One of the consequences of unsubstantiated medical information circulation is ‘infodemic’, defined as “too much information including false or misleading information in digital and physical environments during a disease outbreak which causes confusion and risk-taking behaviours that can harm health” [7].

It is commonly stated that research evidence takes an average of 17 years to reach clinical practice [8]. If the translation process accelerates in the right way, the return on investment in research will rise. Healthcare professionals may be able to advance the process of "research into practice," which is converting promising interventions in clinical research into healthcare practice [8]. Healthcare professionals are trained to provide evidence-based care for patients and have expert knowledge of evidence-based practice in a specific area. Their knowledge is, to some extent, exclusive, which may be one of the reasons why many eHealth intervention development projects continue to use top-down approaches. They may have preponderance to have the initiatives on eHealth development to deliver evidence-based care due to their specialised knowledge, networks in the relevant field, and hands-on clinical experience. Nowadays, with an increasing emphasis on patient-centred care, which focuses care delivery on patient needs and preferences, it is necessary to maximise and optimise the engagement of patients and other stakeholders in the intervention development, as well as incorporating implementation considerations in the early stages [9]. Although some of the eHealth intervention development reports produced by healthcare professionals incorporated concepts such as human-centred design, user-centred design, participatory design, and so on [10-12], the lack of design knowledge and experience limited their capacity to use interactive methods. Most of the studies involving patient and/or other stakeholders in the eHealth development process rely excessively on traditional interviews and focus groups. These methods are well suited to pose direct questions, but therefore have a limited ability to elicit tacit knowledge [13]. Additionally, the multidisciplinary nature of eHealth and the rapid pace of technology development cause challenges in eHealth development projects initiated by healthcare professionals. It is difficult to combine different approaches from the fields of healthcare and technology. Research and dissemination in global public health moves at a slower pace than technology development, beginning with formative research, followed by measuring efficacy, and then effectiveness [8]. It is critical for healthcare professionals to have access to and comprehensive knowledge of how to partner with end users and other stakeholders in the eHealth development process to facilitate initiatives proposed by them and avoid top-down approaches in eHealth development projects. Design education has been applied to medical education, and it has been argued to be important for addressing the challenges posed by complex health care problems [14]. It is therefore crucial to empower healthcare professionals, who are working with eHealth intervention development projects, with design skills and mindset. On the other hand, the roles and responsibilities of designers in the twenty-first century have been controversial. Many farsighted designers assert that we are at a turning point of transforming design from an expert-driven process focused on objects and services within a taken-for-granted social and economic order towards design practices that advocates design-led societal transition toward more sustainable futures [15]. To foster the transformation, design education should cater to all abilities. However, it is challenging to initiate and design the tailored courses for healthcare professionals, as they have diverse professions and are uninitiated in design skills.

Health CASCADE is one of the European Union-funded multidisciplinary expert networks with the ultimate goal of delivering the rigorous scientific methodology to consolidate co-creation as an effective tool to fight public health problems [16]. Imparting the knowledge of co-creation in public health to healthcare professionals has the potential to empower them with design skills and mindset in an appropriate way. Knowledge of co-creation may help to alleviate the gap between design and healthcare, meanwhile providing an added value of opportunities for stakeholder participation in the development process to increase trust. This paper illustrates a curriculum development process partnered with a healthcare professional working with 1177.se – Support and Treatment (1177.se - Stöd och Behandling) in Sweden. The aim of the curriculum is to deliver knowledge of co-creation in public health to healthcare professionals who are responsible for designing and publishing eHealth programmes on the national primary health care support platform, 1177.se – Support and Treatment in Sweden. 1177.se – Support and Treatment platform is well-known and credible by Swedish population. However, scientific studies using proper study design on tools available at this platform are rare. The reflection on the

curriculum development process contributes to the notion of empowering healthcare professionals with healthcare design abilities.

## 2 CO-CREATION IN PUBLIC HEALTH

Co-creation has become increasingly popular in a variety of scientific disciplines in recent years. In research projects involving the development of public health interventions, funding and governing bodies are increasingly encouraging end users and other stakeholders to participate in the development process to bring about beneficial societal changes [17]. However, there is no standardised definition of co-creation in developing health interventions. Other terms that are frequently used in the literature include co-production and co-design [18,19]. Co-creation differs from co-design and co-production because of their different emphasis placed in practice based on their different characteristics and origins [18,19]. Co-creation is focused on an iterative process, involving various stakeholders throughout the process, as well as creative problem solving. Co-design can be considered as a specific instance of co-creation and may also be considered as a collective design process between designers and those who are not trained in design, while co-production may place more emphasis on implementing determined solutions using existing resources [18,19]. But the terms are often reported interchangeably. There have been recent calls for moving towards authentic and meaningful ‘co’ approaches [17]. Some of the research reported that co-creation practice appeared to limit the patient's role to functioning as an information provider rather than an active co-creator [20]. Health CASCADE aims to fill an important gap in knowledge, as surprisingly there is a lack of research investigating the validity of these claims and quantifying the actual impact of co-creation in public health. One of the primary tasks of Health CASCADE is to cascade co-creation skills and expertise by training a new community of professionals capable of working across disciplines, and public and private sectors. There is a need to disseminate this knowledge to the many actors that will, ultimately, engage with local stakeholders to co-create new interventions within their localities and regions. As an attempt, Health CASCADE launched the Evidence-based co-creation Masterclass and Guidelines. The researchers in the field of public health responded favourably. This project aims to further disseminate the co-creation knowledge to healthcare professionals working with eHealth programme design.

## 3 METHODS

Three co-creation meetings with a healthcare professional working with designing and publishing interventions on 1177.se – Support and Treatment in Sweden were held on 21st Oct 2022, 26th Oct 2022, and 8th Nov 2022. Following each meeting, the healthcare professional discussed with team members who work as digitalising business developers and brought the team members' opinions to the next meeting. 1177.se – Support and Treatment in Sweden is a well-known and established national healthcare support platform for publishing online evidence-based health interventions. According to studies, the development of eHealth interventions should consider contextual factors, fit into daily routines, and not jeopardise the existing hierarchy between patients and healthcare professionals [21-23]. Every residence in Sweden has access to 1177.se – Support and Treatment, which has an advantage when publishing eHealth interventions as it is a part of the current national care process.

*Table 1. Curriculum development process*

Meeting	Description	Format
No.1 (21 <sup>st</sup> Oct)	<ol style="list-style-type: none"> <li>1. The healthcare professional gave examples of the previous and ongoing team projects on 1177.se – Support and Treatment, as well as an overview of the process for each eHealth intervention from initiative to launch;</li> <li>2. Discussion on the benefits and drawbacks of the Inera-enabled eHealth programme builder, which is used to design and develop eHealth programmes for the 1177.se – Support and Treatment</li> </ol>	Digital (2 hours)
No.2 (26 <sup>th</sup> Oct)	<ol style="list-style-type: none"> <li>1. Discussion of potential challenges and solutions for putting the co-creation sessions into action;</li> <li>2. Discussion on the benefits of implementing co-creation sessions;</li> <li>3. Co-created the initial curriculum draft.</li> </ol>	Offline (2 hours)

No.3 (8 <sup>th</sup> Nov)	1. Evaluation on the developed curriculum.	Offline (2 hours)
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(More meetings are scheduled.)

## 4 RESULTS

### 4.1 Inera-enabled eHealth programme builder for the 1177.se – Support and Treatment

Inera is a company owned by regions and municipalities in Sweden. The mission of Inera is to create conditions for digitalising welfare, by providing the owners with common digital infrastructure and architecture. 1177.se – Support and Treatment is one of the e-services Inera is responsible for. Most of the eHealth programmes that are designed via Inera focus on fostering improved patient-healthcare provider communication and/or disseminating evidence-based knowledge for disease management. One such co-created eHealth intervention is Min KOL (i.e., an interactive application to promote the self-management skills among people with COPD, and meanwhile improve the communication between patients and healthcare providers), which was published on 1177 via the Inera platform [24]. The creation of Min KOL demonstrated that the incorporation of co-creation practice in the development process had a significant positive impact on the final product.

Six advantages of Inera were identified through the meeting with healthcare professionals: a) Consistency, b) Authority, c) Usability, d) Inclusivity, e) Connectedness, and f) Data management.

a) Consistency. The platform follows the same protocol for every intervention published, which makes the interventions accessible for users by not requiring additional system learning.

b) Authority. As 1177.se is a national medical information system under the Swedish Medicines Agency, the authority contributes to the user trust. Data security is ensured.

c) Usability. Inera provides a design-friendly environment for healthcare professionals to develop interventions without professional human-computer interaction skills.

d) Inclusivity: All healthcare professionals who are in charge of creating eHealth interventions on the platform underwent the required training. Every intervention must be accommodating to people with achromatopsia, as well as those with hearing issues and vision problems.

e) Connectedness. The eHealth intervention designed by one region can be asked to share the transparent design process. If it is too complicated to learn, it can be adapted by another region through a region payment.

f) Data management. Patients use their identity number to login to the platform, which allows data to be traced and contributes to continuous care support. Healthcare professionals use their id-card (i.e., known as the SITHS-card) to access the system. It ensures the security of the e-service.

The challenges of using Inera identified by healthcare professionals are around publicity, interactivity, and compatibility. When a well-developed eHealth intervention is not widely used, issues in the publicity arise. Before the launch, an implementation plan should be developed in collaboration with stakeholders. When it comes to creating eHealth interventions, the Inera platform is constrained by its modular functionality. Healthcare professionals suggested gamification to increase the user acceptance towards the interventions, but they also described it as challenging to implement on the Inera platform. Another challenge is that the platform is separated from the electronic medical record system. Healthcare providers has many separate systems to login to so it's a challenge to introduce another system to them.

### 4.2 The perspectives of the healthcare professional team on implementing co-creation sessions

Healthcare professionals endorsed the notion of implementing co-creation sessions. They claimed that the co-created eHealth interventions may be more easily accepted and spread because stakeholder input can be incorporated throughout the development process. After receiving specialised co-creation skill training, healthcare professionals believe they can feel more confident about advancing their co-creation skills. However, the specific issues brought up by healthcare professionals centre on how to design a tailored co-creation process for the intervention target population. Healthcare professionals brought up the issue of not having guidelines to adhere to when creating eHealth interventions. They acknowledged the potential value of co-creation but noted the lack of readily available resources.

### 4.3 Curriculum

Table 2 shows the three phases of the curriculum: groundwork, development, and design. It will be tested, and feedback on potential improvements will be collected.

Table 2. Curriculum for co-creation sessions

Phases	Session objective(s)
Phase 1	<ol style="list-style-type: none"><li>1. Learn about the definition of co-creation in public health;</li><li>2. To comprehend why co-creation is needed in health care;</li><li>3. Demonstration on case studies of co-creation employment in the eHealth intervention development;</li></ol>
Phase 2	<ol style="list-style-type: none"><li>1. To learn how to facilitate co-creation sessions with stakeholders and how to get input from patients and other stakeholders;</li></ol>
Phase 3	<ol style="list-style-type: none"><li>2. To improve human-computer interaction design skills;</li><li>3. To be aware of principles of gamification design for eHealth;</li></ol>

## 5 DISCUSSIONS

From the curriculum development process with healthcare professionals, we discovered that co-creation sessions are desired and valued by them. They concurred that the incorporation of co-creation practice in the development process may improve user's adherence to eHealth programmes. A practical guidance and checklist tailored for healthcare professionals will be helpful in addition to the course. The curriculum development procedure and the course design have the potential to be adapted into a new context, even though we specifically chose a particular context to partner with for course design. Adapting the course that worked elsewhere can save resources associated with developing new courses for each specific context. Additionally, co-creation knowledge has great potential to close the gap between design and healthcare. The learning process can be expanded to include more design techniques and methods, which aids in disseminating design education among healthcare professionals.

## 6 CONCLUSIONS

Co-creation offers a rigorous method for involving end users and other stakeholders actively in the development process, which has great potential for providing design education for healthcare professionals. This paper offers reflections on the curriculum development process that will aid in future co-creation training development for healthcare professionals.

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