

# Usability and Procedure Learnability of Evidence-based Interactive Clinical Systems: Roadmap for a Norwegian-Japanese Research Fellowship

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## Introduction and Background

Health information technology and information technology support for medicine are research priorities in Norway and Japan [1]. Japan is known for being one of the leading countries on innovative health technology developments, such as nursing robots. It was estimated that only the market for nursing robots would increase to ¥400 billion (around 30 billion NOK, 3 billion €) by the year 2035 [2]. This illustrates the innovation possibilities in the health technology sector. Norway has an above average rate of health service digitalization within the EU. Health technology was introduced into health education to further support professional health technology usage. In both countries, research and education in health technology is one of the pillars for society development and government priority.

Research and education on health information technology are closely connected in a way that latest developments should be introduced in education for next generation of health professionals, and theoretical principles (e.g., technology ethics, clinical and patient outcomes, safety) should be a core of health technology education to instruct the future generation of health technologists. Existing clinical procedures may be refined while new ones are introduced based on user needs and requirements. This situation requires health professionals and students to learn not only existing but new procedures as they are developed and used in clinical practice. However, the need of having to synchronise health education and practice regarding new procedures, technology and indicators demands an active learning where instructors (e.g., teachers, health professional in charge of a health department) and learners (e.g., health student, technology student, health intern, health professional) are supported by digital learning tools that allow them to quickly but effectively access procedure content and observe how procedures are operated in real life. To ensure that technology is accepted and usable for professional use, it must be integrated into the education process at the same time [3], which poses the challenge of learnability and continuous learning. In this scenario, the usability, accessibility and end-user contribution to digital health learning play a key role for the effectiveness, satisfaction and user experience of the learning process.

## Methods

An interdisciplinary systematic research approach is proposed to cover aspects of information and communication technology, human-centred design, usability and user experience (UX) together with learning theories to support the learning and execution of clinical procedures. This includes the analysis and improvement of existing technology support within clinical workflows and education.

Table 1 – Research Questions and Targets

Research Question	Research Target
What are stakeholders' needs for digital technology support for health learning?	Stakeholders' needs
How can users contribute to the making and use of digital technology support for health learning?	End-user contribution
What methods are appropriate to analyse the effectiveness, efficiency and satisfaction of digital technology support for health learning?	User-centred design, Usability, technology adoption
How to handle the sources of clinical procedure and clinical outcomes to include them in digital technology support for health learning?	Big data

## Expected Results

The aim is the evaluation, development and improvement of technology support used in specialized health services and health education. Additional results include the establishment of a cooperation between the Osaka University and the University of Agder to foster a participatory health technology education. Clinical outcomes and patient safety will be core of the assessment. These two factors are expected to improve with enhanced usability and UX of technology support.

## References

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- [3] Nakamura, Y., Majima, Y., & Fukayama, K. (2016). The Usefulness of the Electric Textbooks at Nursing Practicum by Analyzing the Usage. *Nursing Informatics 2016*, 1038. [accessed: 21/05/2018]

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