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# The Definition of Informatics Competencies in Finnish Healthcare and Social Welfare Education

Alpo VÄRR<sup>a,1</sup>, Minna TIAINEN<sup>b</sup>, Elina RAJALAHTI<sup>c</sup>, Ulla-Mari KINNUNEN<sup>d</sup>,  
Lea SAARNI<sup>b</sup> and Outi AHONEN<sup>c</sup>

<sup>a</sup> Faculty of Medicine and Health Technology, Tampere  
University, Tampere, Finland,

<sup>b</sup> Tampere University of Applied Sciences, Tampere, Finland

<sup>c</sup> Laurea University of Applied Sciences, Espoo, Finland,

<sup>d</sup> Department of Health and Social Management, University of  
Eastern Finland, Kuopio, Finland

**Abstract.** Finland is a world leader in the use of public electronic services. Continuous improvement to competencies is a prerequisite for the success of digitalisation in the service development sector. The increasing use of information technology in health and social care needs to be taken into account in the education of the health and social care sector work force. The mandate of the national SotePeda 24/7 project is to identify and define the informatics competencies required for multidisciplinary education of this sector in Finland. The project has adapted international recommendations for use in the national context. The national recommendation covers 12 areas of competency and related content. In addition to defining competencies, the project has produced a toolbox of materials for use by educators of these topics in universities that cover applied sciences and lifelong learning. The results of the project are expected to significantly improve the preparedness of graduating health and social care and related engineering and business sector students to make full use information technology, all of which benefits the national health and social welfare system.

**Keywords.** competence, skill, informatics, information technology, health care, social care, education

## 1. Introduction

Finland has the highest percentage of eHealth service users in the European Union (EU), (i.e., representing almost 50% of users). Generally, only 18% of EU citizens use online health care and social welfare<sup>2</sup> services [1]. A key objective of the National Finnish eHealth and eSocial Strategy [2] is to support the renewal of the healthcare and social welfare sectors. It emphasises the active role of citizens in maintaining their own well-being, which can be achieved by improving information management and increasing the

1 Corresponding Author, Tampere University, Hervanta Campus, Sähkötalo, FI-33014 Tampere University, Finland, Alpo.Varri@tuni.fi.

2 In Finland, 'social welfare' is social services, social assistance, social allowance, social loans and related measures intended to promote and maintain social security and the functional capacity of individuals, family and the community.

provision of online services; in this regard, the role of healthcare and social welfare professionals is crucial. A primary goal is that, by 2020, professionals in health care and social welfare will have access to information systems that support their work and its operating processes. The measures extend to national responsibility, for example, of training professionals in information management, as well as data entry, data protection, information security and knowledge management. The eHealth strategy of the Finnish Nursing Association 2015–2020 incorporates these objectives, with the aim of imparting competencies to nursing students in the use of technology, information literacy, knowledge management and informatics processes. These competencies will also be updated with supplementary training [3].

The increasingly widespread use of information technology [4] to support healthcare and social welfare professionals has created a need to improve informatics competencies in Finland. The Ministry of Education and Culture in Finland financed a national project, the Multidisciplinary Competencies for Health Care and Social Welfare Services in Finland (SotePeda 24/7) [5], with the primary aim of defining necessary informatics competencies and producing educational material for multidisciplinary use at the bachelor level education in the fields of health and social care and related engineering and business sectors of universities of applied sciences (UAS) in Finland. A secondary aim of the project was to support education that prepares students for work in a multidisciplinary team with a view to promoting the health and well-being of customers with the help of information technology. This paper presents how the competence definition work was carried out and what its present result is.

## 2. Method

The knowledge base for the descriptions of the competencies was primarily founded on international definitions of health informatics competencies in the Health Information Technology Competencies (HITComp) database [6,7]. The second version of the HITComp database which we used, is a result of the EU-US eHealth Work Project, an EU-funded project [13]. It was designed for educators, workforce developers, current and future workforce members, students, eHealth managers, staffing authorities, and others in healthcare information technology or eHealth [7]. Our project team used HITComp to search for competencies in a variety of healthcare roles. Competencies (i.e., ‘direct patient care’ and ‘administration’) were sorted into domains. The ‘basic’ and ‘baseline’ level competencies of HITComp were included for further elaboration. A healthcare professional with good knowledge of Finnish and English translated the competencies into Finnish and a group of health informatics professionals checked the correctness of the translations.

To adapt the list of competencies to the national context, the descriptions of the competencies also took into account the competence need findings of the latest studies in Finland based on a literature search. These included the Finnish Care Classification System [8], the eHealth Strategy of the Finnish Nurses Association 2015-2020 [3], the Nurses’ Competence Survey [9], national eHealth and eWelfare system (i.e., Kanta) documentation [10] and research into the competencies of healthcare professionals [11, 12]. The project team of around ten people, consisting mainly of experts in nursing but also participants with social welfare, health informatics and biomedical engineering backgrounds discussed the composition of competencies until a consensus was reached.

The HITComp originated descriptions of the competencies were grouped in the same way as those for the EU-US eHealth Work Project [13]. Areas of competence were initially described using a mind map, which made them clearer and easier to read. Finally, the mind-map was converted to a tabular form which then became the version 1.0.

### **3. Results**

The produced list of informatics competencies required for healthcare and social welfare professional education in Finland can be seen in Table 1. HITComp terminology was used or adapted for the definitions.

### **4. Discussion**

Although international recommendations for informatics competencies for health care professionals are available [6, 7, 14, 15], they are only applicable to a certain extent in Finland. A need remains to adapt the curricula to include components that support the national health care and social welfare environment and culture, as well as national strategic objectives [2, 3]. The competency definitions produced by the SotePeda 24/7 project [5] cater to these needs. For example, the proposed recommendations include social welfare-related competencies that are frequently absent from international recommendations, in addition to knowledge relating to the national health and welfare information repository, Kanta [10]. These recommendations also align with the Finnish eHealth and eSocial Strategy [2], which recognises that work is performed in multidisciplinary teams and sometimes includes business or technology professionals.

The SotePeda 24/7 project will reach completion at the end of 2020; until then, the work on definitions of informatics competencies continues. The 12 defined areas of competence will remain in the final version of competency recommendations. However, any additional feedback obtained from interactions with social welfare and health care authorities may necessitate minor improvements having to be made to the recommendations.

The proposed descriptions of the informatics competencies were valid at the time of writing. Digitalisation, innovations in information technology and new system implementations [4] will, however, necessitate updates to the descriptions from time to time. Each country should have a process in which competent professionals update the competence definitions. Finnish educational authorities on healthcare and social welfare informatics produced the recommendations, and the results will be followed and commented by authorities working in key healthcare and social welfare service positions and research institutions.

In addition to the competency definitions, the SotePeda 24/7 project is also responsible for the production of educational materials that support the educational approaches relating to these competencies. For example, one work package elaborates on educational materials about the ethical aspects of care digitalisation. Specifically, a toolbox has been developed for use by UAS educators (but potentially in other levels, too), who can select the materials and method of instruction of choice. The intention is

that the materials should support monological, dialogical and triological learning. The materials will be stored in a national repository of educational material.

**Table 1.** Definitions of health care and social welfare informatics competencies.

Area of competence	Main content
Basic information and communications technology (ICT) competencies	Information management and its tools, information and communication technologies and information literacy skills. Introducing new operating models, anticipating service and training needs, anticipating future digital literacy skills and motivation.
Online interactive competencies	Online dialogue with persons, changes in the roles of professionals, electronic communication environments, online meetings and consultations and the use of social media and online services.
Service competencies in digital health and the social care sector	Health and social care service structures, the usefulness of electronic health services, different electronic service environments and tools, the roles of social and healthcare actors, electronic service pathways, e-services and virtual reception.
Person-centred guiding competencies in a digital environment	Assessing customers' IT skills, IT guidance for customers, directing customers in search of information, supporting self-care by clients, the preparation of electronic guidelines, the production of online material, electronic outpatient clinics and information services, ie. chat rooms.
Competencies to monitor health and well-being in a digital environment	Artificial intelligence, sensors, robotics, wearable technology, utilities, various monitoring tests and instruments, monitoring information literacy and assessing the reliability and adequacy of information.
Health and social care informatics competencies	The interoperability of electronic systems, the communication of information via electronic information systems, electronic logging, national patient and social welfare data repository Kanta.fi, electronic data storage and roles and responsibilities regarding the use of information and legislation.
Multi-stakeholder service co-development competencies	Assessing the reliability of data sources, information management guidance and collaboration, privacy and security, co-operation and new operating models.
Ethical competencies	Ethical operating models and ethical competence in electronic services.
Service design competencies	User orientation, participation, innovativeness and new service pathways.
Knowledge management competencies	The use of monitoring and research data, customer- and patient-specific information, availability, quality and effectiveness of services (e.g., considering changing needs).
Research, development and innovation competencies	Assessment and continuous improvement of one's own skills, work community skills development, the development of electronic services, quality criteria for electronic services, the development of health and well-being technologies, exploitation of evidence-based information and an evaluation of effectiveness.
Societal competencies	Continuous consideration of information security in operations, the social impact of health technology on well-being and daily life, digital democracy and the promotion of social inclusion.

## 5. Conclusion

This project has significant national responsibility as it comprises recommendations on the healthcare and social welfare informatics educational material and curricula content of nursing students, other healthcare and social welfare professionals, as well as those in related fields (i.e., engineering and business) in UASs in Finland. As almost all UASs that offer this type of education in Finland are involved in the project, it is likely that the

recommendations will be followed at least to some extent. The educational material produced by the project will assist educators to introduce these topics to their students. The present version of the recommendations defines 12 areas of competence, the corresponding content of which is defined in detail. The recommendations are supported by a toolbox of educational materials to be used freely by educators in relevant fields in Finnish universities. It is expected that the recommendations and online educational materials will significantly improve basic healthcare- and social welfare informatics-related education in Finland.

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