



# EU\*US eHealth Work Project

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*Mapping Skills and Competencies; Providing Access to Knowledge, Tools and Platforms; and Strengthening, Disseminating and Exploiting Success Outcomes for a Skilled Transatlantic eHealth Workforce*

### **Case Study: Nursing Informatics and eHealth: Core Competence for Registered Nurses in Need of Development**

Dalarna University, Sweden

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**TITLE** Nursing Informatics and eHealth: Core Competence for Registered Nurses in Need of Development**AUTHOR**

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**ORGANIZATION**

Dalarna University was founded as a higher educational institution in 1977, as part of a higher educational reform in Sweden, which strived to place middle range education-focused areas, such as nursing and physiotherapy, into the academic arena. Dalarna University is celebrating its 41st year in existence this year. However, formal nursing education began in 1894, inspired by the work of Florence Nightingale and the on-going movement to create a more systematic, qualitative education for nurses in Sweden. In-country, nursing education was previously the responsibility of the County Councils, sharing their geographical location in Dalarna with the university beginning in 1994. In 2000, the university took on responsibility for providing nursing education. Dalarna University has facilitated all levels of nursing education since 2012, when the first, 3<sup>rd</sup> level education right (Doctorate level) was received in accordance with the Bologna Agreement in Europe. In 2017, we were happy to acquire approval to provide a PhD programme focused on Health and Welfare, integrating evidence-based practice suitable for nurses and evidence-based clinical practitioners.

The university has nearly 750 employees and provides around 1,100 courses in total, most of which belong to one of the 76 educational programme offerings. There are 15,500 students enrolled in total, 10,000 of whom take online-based courses. The nursing department comprises approximately 60 employees and has roughly 700 nursing students studying on different levels within the system. All nursing education is characterized by a blended learning approach that combines using online-based learning activities that are supported by digital applications and environments, as well as physical encounters between students, teachers, clinical staff and patients. A five-week theoretical course provides two to three physical encounters on campus with the rest taking place online, apart from clinical courses and courses incorporating practical training in a simulated learning environment.

The educational programmes for nurses at the university include:

- Three year basic Nursing Programme (180 credits). Students are eligible to receive two academic degrees on upon successful completion: *Bachelor of Science degree in Nursing* (professional qualification) and a *Bachelor of Science in Nursing* (general academic exam)
- Three Postgraduate Nursing Programmes: *Care for the Aging Population* (60 credits), *Primary health care* (70 credits) and *Care Dementia Patients* (60 credits). Students are able to receiving two academic degrees upon successful completion: *Post graduate diploma in Specialist Nursing* and a *Master of Science degree in Nursing*
- Midwifery Programme (90 credits). Eligible to receive two academic degrees upon successful completion: *Post graduate diploma in Midwifery* and a *Degree of Master of Science in Sexual, Reproductive and Perinatal Health*
- Doctoral Programme (240 credits). Eligible to receive an academic degree upon successful completion: *Degree of Doctor of Philosophy in Caring Science*

The focus of this case study is on the basic nursing programme.

## BACKGROUND

Health care in Sweden is the responsibility of the 20 County councils/regions throughout the country, whereas the municipalities (n= 290) have a responsibility to care for the elderly, inclusive of home-based care. The use of digitalization to support health care (referred to as eHealth), has been implemented all over the health care sector in both a broad and rapid sense. At the same time, person-centred care is emphasised nationally and the possibilities of leveraging eHealth to support patient/citizen empowerment with regard to personal health and health management is developing rapidly.

It is difficult nowadays to find a health care organization that does not have an electronic health record (EHR) system as part of the electronic information system. Furthermore, the developments have been focusing on interdisciplinary, interprofessional solutions for the EHR, moving away from the idea of separate modules depending on professions. We still have difficulties with information interoperability between organizations because of a previous lack of common information models and structures for EHRs and lack of implemented standardized vocabularies, particularly representing nursing, combined with a diversity of providers. However, the situation is improving, considering the implementation of a National Patient Overview (NPÖ in Swedish). NPÖ enables authorized healthcare professionals to obtain journal information, with the patient's consent, registered within other county councils, municipalities or private healthcare providers. In addition, work is conducted using standardized terminology in healthcare from the 10<sup>th</sup> revision of the International Statistical Classification of Diseases (ICD-10), the International Classification of Functioning, Disability and Health (ICF) and a national intervention classification. Systematized Nomenclature of Medicine—Clinical Terms (SMOMED-CT) was translated and efforts are being made to implement it in various areas as reference terminology. Unfortunately, nursing terminology in systematic use does not currently exist, apart from in smaller areas, even though the North American Nursing Diagnosis Association (NANDA) and International Classification for Nursing Practice (ICNP) are available in Swedish. The Wellbeing, Integrity, Prevention and Safety (called VIPS in Swedish) model [3] has been used since 1991 up until recent years for documenting nursing in accordance with the nursing processes. The model is still used as a guiding theoretical framework for nursing, especially in education, despite the fact that key terms within the model are not used explicitly in EHRs today. Several VIPS concepts remain as key terms but have now been mixed with other terms in the pursuit of a common interdisciplinary EHR.

There are many eHealth services available for Swedish citizens and the number is increasing rapidly. A huge advantage is the existence of personal code numbers in Sweden. This enables clinicians and practitioners to tailor various services, with high login security, to the individual, thus providing care in a safe and secure manner while still respecting personal integrity. The national website [1177 Vårdguiden](#) (Swedish for care guide) also provides access to specific regional perspectives and information to the public on a broad spectrum of topics related to health and health care (e.g. rules and rights). It also enables citizens to seek healthcare, information on self-care and facts and advice on a number of health conditions. It is also possible to email or call to obtain information and advice. Here, citizens can use the site to book or reschedule appointments and manage their medications. Today, all prescriptions are requested and fulfilled electronically; the patient can pick up their medication at a pharmacy of their own choosing. Online digital healthcare centers are also available to provide appointments via a video conference

platform (telehealth). Finally, the individual can access parts of the EHR online in a secure manner, although currently, the information available varies slightly throughout the country. Easy to access online treatments, such as cognitive behavioral therapy, are also available.

### STATUS/CURRENT DEVELOPMENTS

eHealth is an explicit and important part of health care in Sweden, changing the conditions, possibilities, content and roles for both patients and health professionals. We need to better prepare nursing students so that they are able to take a professional responsibility and provide high quality nursing care in this ever-changing health care system, characterized and supported by eHealth.

In 2012, we accomplished a major quality work goal centered on benchmarking our nursing programme to the quality indicators for e-learning in the programme *Excellence*, described by the European Association of Distance Education Universities (EADTU). We investigated our own strengths and weaknesses in a report and were scrutinized by a panel expert on the European quality benchmark for online, open and flexible education. We were happy to be acknowledged as a qualified institution from 2013-2016. Although a new application was not included in our development plan post 2016, parts of the constant improvement agenda were implemented.

The curricula of the nursing programmes at Dalarna University conveys increased nursing knowledge, but are also rooted in the five core competencies identified by the Institute of Medicine [1]. Graduates in any health care profession must be able to deliver *patient-centered care* as part of work in an *interdisciplinary team* emphasizing *evidence-based practice*, work with *quality improvement* and employ skills in *informatics* [1]. *Safety*, a sixth core competency proposed by the Quality and Safety Education for Nurses (QSEN) [2], is also included. Informatics holds a unique position in that it can be a core competency in itself while also supporting other competencies, as this is an important part or prerequisite for several of the other competencies. The core competencies run through the programme curricula, where the most troublesome is to address interdisciplinary collaboration, since we do not have our own education for professions like physicians or physiotherapists. However, clinical placements are identified as an area of opportunity for interprofessional collaboration.

More specific support for nursing informatics (NI) education was provided by the work from the Section of NI within the Swedish Society of Nursing, which development health informatics (HI) competences for Registered Nurses (RN). The work of the Technology Informatics Guiding Education Reform (TIGER) Initiative has provided guidance with the competence model by identifying three important parts: *Basic computer competencies*, *Information Literacy* and *Information management* [4].

The students already have *Basic Computer Competencies*; if they do not possess these skills, they will acquire them with the nursing education provided in the programme. Access to personal computers is very common in Sweden and they are used extensively in all parts of the course. *Information literacy* is taught, practised and refined throughout the programme, from courses in research methodology, which underpin all content in various more theoretical courses via experiences of an evidence-based practice approach in clinical educational settings, to finally conducting a semi-systematic literature review as an examination thesis. The nursing and research processes require the same way of critical thinking as outlined under information literacy, as these processes have many resemblances. Support of the students' systematic way of thinking also implicitly functions as a training component within the information literacy competence.

*Information management* is taught extensively with the underlying concept: data-information-knowledge. The educational system supports the students' critical position towards learning something new and then owning learning experiences using reflective thinking as a vehicle. Differences between data, information and knowledge is part of the programme, focused on documentation practice. The potential with using standardized terms is emphasized as a means of secondary use of data from the EHR in order to build knowledge and work with quality improvement. The importance of data and RNs access to valid data, data analytics and the use of decision support is also stressed. A variety of standardized assessment instruments are taught using online versions. Sweden has a long tradition of keeping medical quality registers (there are more than 100 national registers with various focuses), which is beneficial, as the amount of sensitive information available in nursing is slowly increasing.

Another central competency is being able to use information systems when delivering health care; not only utilizing the EHR but also systems for administration, collaboration and information sharing between caregivers or other applications in the information system. The university does not have access to training EHR systems that are present in regional clinical settings. However, each student gets an introductory six-hour course about the system and is provided a unique login during the programme's clinical placements in various facilities. The students have seven different clinical practice periods via the county council in hospitals and primary care as well as in home based care for the elderly and special housing in municipalities throughout the region. The information systems differ between organisations, thus providing the students a varied learning experience. However, it would be beneficial and increase student learning possibilities if the university did have systems access. If access was granted, we would be able to problematize the functionality, test user friendliness and identify other potentials within the systems. Now it is more restricted to learning how to use the system. Critical discussions can take place during seminars, clinical placements and in dialogue with clinical supervisors, but is dependent on the teachers' own knowledge in these areas. Questions regarding ethics, confidentiality, access control, security and discussions related to the use of eHealth application in clinical practice and patient access to data and information are also discussed when opportunities arise.

A common problem found in higher educational institutions in Sweden is that the teachers often lack sufficient competences in nursing and HI, as is the case at our university. Very few teachers have the necessary breadth and depth of informatics competence.

### **ACTIVITIES/MEASURES**

The nursing students are given a broad perspective on eHealth where different aspects are highlighted during the programme. The programme provides a general basic competence that should be useful wherever they seek employment after graduation.

The nursing education, both at the undergraduate and graduate levels, is characterized by a student-centred, blended learning approach where we use synchronous communication to a high extent. Each course lasts five weeks and provides 7.5 European Credit Transfer System (ECTS), which comprise approximately two to three obligatory physical encounters at the university. Students are also provided with opportunities to choose the format for these learning activities. The student may physically attend a lecture at the university, take part in real-time lectures over the internet with access to a chat function for both the teacher and fellow students, or take part in a lecture at a later point in time without the possibility for interaction. The university uses Adobe Connect for online meetings and provides access to

more than 120 virtual meeting rooms on our own server (n= 120), a magnitude larger than what is provided for the universities throughout the rest of Sweden provided by the Swedish University Computer Network (SUNET).

Course seminars often take place online and in some courses participate in the development of a Wiki (a website or database developed in collaboration with a community of users, <https://en.oxforddictionaries.com/definition/wiki>) to support students' collaborative learning. This approach, apart from pedagogical reasons stressing student centeredness and flexibility, is used as a means of making the students better acquainted with communicating via online applications and using online search features to acquire necessary information. These eLearning experiences are viewed as an implicit part of an ongoing eHealth education. Moreover, the extensive use of net-based sources to support students' learning also supports the development of various aspects of eHealth competence, awareness of what is out there for patients to use, etc.

Nursing documentation in accordance with the nursing process is taught each semester, with increasing complexity over time. A package of six pre-recorded lectures serve as a foundation for learning and seminar discussions include: Documentation, regulations, nursing process, the VIPS-model, clinical decision-making and nursing diagnosis. The ability to make nursing care plans is introduced in the second semester with a focus on systematic assessment of signs, symptoms and understanding the concept of nursing diagnoses.

This is further elaborated on during the third semester in a six-hour lecture incorporating expected outcomes, interventions and diagnosing more complex health conditions, while also introducing standardized vocabulary from NANDA and ICNP. A practical session is also held to create nursing care plans from patient scenarios. Documentation assignments are present in all courses with clinical practice in semesters four through six. Electronic communication occurs between the hospital, primary care and municipalities. Documentation in epicrisis and electronic communication related to discharge are part of the experience bundled into the fifth semester. Previously, students also assessed data in the clinical setting, which then was analysed and forwarded back to the professionals, e.g. prevalence of pressure ulcer and adherence to hygienic routines. Currently, these learning activities are not in place, however, we acknowledge that they ought to be. At the end of the semester the students review nursing documentation during their clinical placements using validation instruments. Rules focused on secrecy and integrity make it impossible for them to access information from the EHR for educational purposes.

The students receive a three-hour eHealth lecture in the third semester separate from documentation practices. The development of this fast moving field is described and examples of different applications and their uses in health care are given. eHealth services directed at citizens are described and problematized. Discussions about virtual meetings in health care take place, often with resemblances to their own experiences with online meetings at the university. Further topics discussed include robotics, artificial intelligence and other emerging trends the new materials introduce. The need for an overarching ethical perspective is stressed: we do not need to do it just because we can. eHealth inevitably needs to be combined with discussions about ethics, integrity and confidentiality.

The patient's perspective is also central to eHealth. This is addressed in various courses and a specific three-hour lecture is given in the third semester, where consumer informatics, mobile health (mhealth) and the variety of eHealth services for citizens are discussed.

### **CHANGES**

eHealth/informatics is regarded as one of six core professional competencies that RNs need to master. Informatics competence is largely intertwined with other core competencies, and there are several educational components in place. However, eHealth/informatics needs to be addressed more thoroughly and systematically throughout the nursing program. We often do not focus on eHealth competence on a sufficiently specific level or support an explicit awareness of the fact that eHealth is an aspect of various topics in nursing, neither in the student group nor among the teachers.

A review of on-going educational activities and content regarding eHealth/informatics in the nursing program is planned for the upcoming year. Internal faculty discussions about the curricula are often explicitly inspired by the literature being taught. The goal is to identify necessary changes in learning outcomes and activities. A person responsible for leading this work is assigned to each task.

Participation in the activities described above have the ability to increase a teachers' own competence; education directed at faculty will also be implemented in the upcoming year. The teachers in general have limited knowledge and understanding of eHealth topics, even though some educational activities have taken place over the years. New faculty members are invited to join the group.

The possibility for the university to obtain EHR access for learning purposes will once again be addressed with our partners in the County Council. Finally, the possibility of reintroducing systematic reviews during clinical placements to aid nursing documentation practice and to conduct small studies (e.g. pressure ulcer prevention) that feed into the quality improvement work being done will be also examined again.

### **RESULTS**

We have quite a high informatics competence depending on societal conditions and possibilities. The students in the current nursing program have an increased competence level compared to that of students from a couple of years ago. General knowledge has increased, but it is hard to know if the program's evolution is a result of the curricula enhancements and educational activities, or increased access and use in the student groups combined with a rapid increase of applications and solutions available. Most likely, Sweden's eHealth adoption has made the major difference.

Moreover, we need to improve eHealth competence by providing more focused learning activities that support the students trajectory with moving to even higher grounds, being able to be better, more critical users and specifiers on eHealth solutions, always holding the ethical perspective high and close to their hearts.

### **OUTLOOK/LESSONS LEARNT**

We have a need to address these topics in a better ways – both in the educational and clinical settings. The planned quality improvement work is poised to result in a clearer way of teaching eHealth with more than a few teachers having sufficient knowledge in this critical area.

## References

- [1] Institute of Medicine (2003). *Health Professions Education: A bridge to quality*. Washington, DC: National Academies Press. ISBN: 0-309-51678-1. Available at <http://wwwnap.edu/catalog/10681.html>
- [2] Cronenwett, L., Sherwood, G., Pohl, J., Barnsteiner, J., Moore, S., Sullivan, D.T., Ward, D. & Warren, J. (2009). Quality and safety education for advanced nursing practice. *Nursing Outlook* 59, 338-348.
- [3] Ehnfors, M., Thorell-Ekstrand, I. & Ehrenberg, A. (1991) Towards basic nursing information in patient records. *Vård i Norden* 21(3-4), 12-31.
- [4] Hübner, U., Shaw, T., Thyne, J., Egbert, N., Marin, H. & Ball, M. (2016). Towards an International Framework for Recommendations of Core Competencies in Nursing and Inter-Professional Informatics: The TIGER Competency Synthesis Project. *Studies in Health Technology and Informatics*, 228, 655-659.

## Case Study Checklists

### Checklist of eHealth topics (competencies)

*Role of "Peopleware":* human factors, awareness, satisfaction and acceptance of health IT, usability measurements, evaluation of health IT, communication, leadership, change management, ethics and IT and similar topics

Role of "Peopleware" is very important. As described above, we have a rather comprehensive use of IT-solutions supporting health care, both as citizens and as nurses. However, we still have a long way to go with satisfaction and acceptance of IT-solutions. The personal/human perspective in this, from satisfaction, leadership and change management as well as ethics issues, are important aspects in supporting nurses' education. Our goal is to educate critical thinking skills for the development, use and benefits of using eHealth along with an ethical perspective on the question: "even if we can do it, do we need to, or want to do it?" This should be considered in relation to patients and towards the nursing profession or health care personnel in general.

*Role of inter-professional approaches:* inter-professional versus mono-professional training and learning activities. What subjects lend themselves to inter-professional vs. mono-professional classes, learning environments and similar topics.

The Nursing programme has difficulties establishing inter-professional learning activities apart from clinical practice. Dalarna University does not currently have programmes for physicians, physiotherapists and other professional groups. In collaboration with other universities, Dalarna relies heavily on the clinical arena and the County Council. There is much to gain from establishing an inter-professional learning environment

*Role of healthcare data sciences:* data and information acquisition including documentation, data quality, data, information and knowledge management, data analysis and statistics, clinical decision making instruments, reporting and similar topics

Documentation is an important aspect in the education, especially when it comes to gathering, documenting, storing and retrieving information. Our education programmes are partly theoretical but

mostly provide hands-on learning experiences during clinical placements in various parts of the health care system. As mentioned earlier, all students have access to the EHR during clinical placement, and are active with the entire process of gathering, storing, retrieving and understanding the data/information. The idea of secondary use of data/information is taught, and to some extent practised during clinical placements. However, the legislation in Sweden hinders use of EHR content for purely educational causes. Decision support instruments are used in various fields of nursing, often in electronic formats. For example, students use add-on decision support to the EHR displaying information about medication and side effects. It is named FASS in Swedish, a summary of drug facts (in English: Pharmaceutical Specialties in Sweden). Much is done in the area, but could benefit from being more explicit regarding what kind of informatics competence is actually learned.

*Fusion of medical technology & informatics:* software as a device, smart devices, automatic data acquisition via devices, risk and safety management

We do not have access to a lot of medical technology at the university, but the students get access to whatever technology is used to support care in the clinical setting. All students use the SITHS-Card, a national solution for secure identification of personal identity and/or function, which enables single-sign-on solutions. The solution is accredited and approved by Microsoft globally.



*Role of process and workflow management:* clinical and administrative processes, information continuity and information logistics, management of processes, workflow management systems and similar topics

The students are taught about management in nursing in general terms. However, the management role is the hardest to achieve, which is also pointed out in student evaluations during the nursing programme. The specific use of informatics skills to perform management functions is not trained at the basic level; it is more a question for training specialist nurses on the 2<sup>nd</sup> level.

*Role of ethics, legal and data protection issues:* ethics and IT, legal requirements, data protection and information self-determination, data safety and similar topics

Ethics is a key component underpinning all nursing care, and eHealth is not an exception. Ethics is discussed when talking about IT solutions, e.g. access to EHR online, and information management in health care. The need to protect data and have systems for securing proper access to patient information is stressed.

*Role of learning and teaching:* learning techniques (“learn how to learn”), learning and teaching styles (online, blended, face-to-face), learning management, information management for learning and teaching and similar topics

The learning environment at the university uses a blended learning approach characterized of flexibility for the students to choose their learning activity format. We use online learning to a high extent with online lectures and seminars, most often in synchronous encounters. This experience is thought to influence the students’ capability to use digital support for communication and creating/using learning activities in the patient encounters. A nurses teaching/informing role is thought to be more important, since information is available for everyone in the society, in a more general way now compared to before.

*Role of management related topics in health informatics and IT:* principles of management, strategic management, stakeholder and change management, leadership, financial management, risk management, quality and safety management, resource planning and management and similar topics

These competencies are not taught to a high extent in the basic nursing training on 1<sup>st</sup> level.

*Role of technology:* information and communication systems, telemedicine, telematics, assistive technologies, mHealth, life-cycle-management including systems development/engineering

The role of technology is stressed and examples are provided regarding telemedicine, assistive technological devices and telematics. However, the movement in Sweden has been from focusing on the technology in itself toward the use and purpose of using the technology, namely health. In 2010, the Swedish IT Strategy changed its name to “eHealth Strategy”.

*Role of consumers and populations:* consumer health informatics, public health informatics

We use person-centred care as a core principle and goal for nursing education. Therefore, consumer HI is addressed and the use of technology in health care is viewed with the context of how it can support patient power, control and own possibilities to take on an active responsibility for health issues. The situation with viewing the patient as a consumer is also problematized in Swedish health care regarding the change in roles, responsibility and demands. A consumer role is characterized of “buying” a service, having right etc. The role depends very much on the health care system and the financing of it. In Sweden, we have a publically financed health care system, even if there are many private caregiver organisations. The Swedish Health Care Act gives the citizens the right to receive equal treatment, but not to receive whatever treatment a person may demand.

“Chapter 3, Section 1: The purpose of health care is good health and equal treatment for the entire population.”

The care should be given with respect for all people's equal worth and for the dignity of the individual. Those with the greatest need for healthcare should be given priority to receive care. -Swedish Health Care Act

*Role of Research:* information management in research, data analytics

Information management in research and data analytics are not addressed in relation to eHealth and informatics specifically.

*Role of interoperability:* systems integration, IT standards, terminologies and classifications

The students are taught some basic aspects about terminology work (e.g. difference between concepts and terms, different terminology models), and standards are described (e.g. International Organization Standardization (ISO) standard 18104 for categorical structure of nursing diagnosis and nursing actions). The development in Sweden with the development of informatics models for health care and need to structure information in order to be able to communicate between different electronic information systems (interoperability) is discussed.

Furthermore, lectures describing nursing terminologies as well as the national standardized professional language in Sweden is taught (ICD-10, ICF, KVÅ (Swedish intervention classification) and SNOMED-CT). The majority of nursing terminologies are described but the students gets experience from using NANDA and increasingly also ICNP when developing nursing care plans

### Checklist of eHealth topics (gaps and deficiencies)

*Teaching the teachers:* Are there any activities in your organisation to teach health IT/eHealth to teachers in healthcare?

There are some efforts to educate the staff, but not in a systematic manner. There have been presentations at common meetings, mostly regarding documentation and the use of standardized vocabulary.

*Supporting participatory design and acceptance testing/research:* Are there any educational activities to teach or practice participatory design? Are there any activities including research in user acceptance testing and satisfaction measurement?

There are no educational activities to teach or practice participatory design. Some research at the faculty comprise the development of IT solutions supporting participation, which has been developed using user panels.

*Integrating eHealth/health informatics into traditional curricula:* Are there any activities to include eHealth/health informatics into traditional curricula of physicians, nurses and other health professionals with direct patient care?

See the description above regarding the inclusion of eHealth in the curricula.

*Motivating clinicians and managers:* Are there any incentives and opportunities for clinicians and healthcare managers to acquire and update digital eHealth/health informatics skills and knowledge?

Not addressed by the university for the moment, but some activities are in place at the County Council.

*Engaging women:* Are there any activities to attract female students in eHealth/health informatics or employ female health IT staff?

We do not employ specific health IT staff, but the teacher staff is 90% female.

*Updating teaching and learning material:* Are there any activities to ensure that the material is up-to-date and of high quality?

The EHR school module that the students use in the County Council is updated for training purposes by that organization. Learning material at the university is a question for each teacher active in that area.

*Availability of courses including electronic courses:* Are there any additional activities to improve the availability of courses such as implementation of new courses, new course formats that recognise previous experiences/training in particular for continuing education?

The nursing programme uses digital solutions to support learning to a high extent. We always strive to develop the educational methods, e.g. now flipped classroom, creation of wikis in the courses, etc.

*Shortage of health informatics specialists:* Are there any programmes to attract health informatics specialists?

We do not have any courses to attract informatics specialists.

*eHealth Budget:* Does your organization, area or region have a dedicated budget set aside for eHealth/health informatics training, education or workforce development initiatives?

N/A

*eHealth Specialty Areas:* Does your organization address any of these speciality settings/areas of training or outreach for eHealth education or workforce development: ambulatory care, social medicine, geriatric/ageing medicine, rehabilitation?

N/A