



# EU\*US eHealth Work Project H2020-SC1-HCO13-2016

*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: An Online-based Master's Program in Health Information Management for Health Care Professionals**

University of Health Sciences, Medical Informatics  
and Technology (UMIT) in Hall in Tirol, Austria

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**TITLE** An Online-based Master's Program in Health Information Management for Health Care Professionals**AUTHOR**

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**ORGANIZATION**

The University for Health Sciences, Medical Informatics and Technology (UMIT) is owned by the state of Tirol and is located in Hall in Tirol, Austria. As a modern university, UMIT is specialized in new vocational fields and research areas and thus responds to the latest challenges in health care and technology.

Focus areas include: Mechatronics, Medical Technology, Medical and Biomedical Informatics, Psychology, Physiotherapy, Health Sciences, Nursing Science and Gerontology, supplemented by university training courses. UMIT offers high-quality academic education and advanced training in fields that have turned out to be of increasing importance in modern health care and technology.

**BACKGROUND**

Modern health care is unthinkable without modern health information technology (IT). Traditionally, Austrian universities offer full-time programmes in medical informatics (MI) or health informatics (HI) at the bachelor and master degree levels.

However, health care professionals, such as physicians and nurses, also need a solid basis on topics related to health IT to be able to efficiently select, implement and use modern health IT systems such as electronic patient records (EPRs). Until recently, these health IT topics were not integrated into basic curricula in medicine, nursing or related programs in Austria. Thus, both physicians and nurses often lack basic competencies in health IT. As a consequence, the "voice of the users" is not heard when designing, selecting and implementing health IT solutions, leading to insufficiently designed and user-"unfriendly" systems that do not fully exploit the inherent possibilities of health IT.

A recent market analysis also confirmed that the health IT industry is looking to hire health care professionals who have an in-depth knowledge of their professional fields, and who combine this with competencies in health IT and health information management (HIM).

This motivated UMIT, as Tyrolean state university, to establish postgraduate courses and programs on HIM for health care professionals.

We define "health informatics management" as management of health information systems, covering fields such as design, development, adoption and application of IT-based innovations in healthcare. HIM thus offers a management-oriented and organizational-oriented access to health informatics.

**STATUS/CURRENT DEVELOPMENTS**

UMIT has a long history in educating specialists in MI. Between 2001 and 2015, UMIT offered full-time bachelor and master degree programmes in MI. Since 2004, nursing science students receive one

introductory module on nursing informatics (NI), both in their bachelor as well as in their master programme.

In 2010, we began offering three-day intensive courses focused on NI tailored to the need of nursing practitioners. These courses are organized once a year and have around 20 – 25 participants each. The courses cover topics such as project management, process management, health IT management, and eHealth and classification systems. Based on the experiences witnessed in these intensive courses, it became clear that longer academic programs are necessary to enable in-depth learning and retain knowledge.

### **ACTIVITIES/MEASURES**

To offer academic qualification for health care professionals in health IT and HIM, UMIT will start with an online-based master's degree programme in HIM in 2018. This programme will cover the following topics:

- IT project management
- IT-based process management in health care
- Applied computer science
- IT and information management
- eHealth and electronic patient records
- Clinical documentation systems and semantic interoperability
- Information security in health care
- Evidence-Based Medical Informatics and Evaluation of Information Systems
- Software Quality Engineering
- Clinical Knowledge Discovery und Data Warehousing
- Certification of medical devices
- Recent topics in health informatics
- Scientific writing
- Master thesis

This HIM master's programme will be targeting physicians, nurses, quality management, process managers, computer scientists working in health care and other health care professionals interested in gaining in-depth knowledge on health information management.

The programme offers a fully online-based programme, utilizing a modern and cooperative instructional design that fosters learning within interdisciplinary groups.

### **CHANGES**

The instructional design of the "Health Information Management" master's degree programme matches the needs of part-time students, such as activating and using preliminary professional knowledge, interacting and learning in interdisciplinary teams and applying new competencies in their own professional context.

All online courses in the programme are based on a modern, cooperative instructional design where weekly learning activities must be completed. The design was inspired by a constructivist understanding of learning, with a strong focus on student activation and interaction. In particular, as instructional

frameworks, elements from social constructivism are integrated with a strong emphasis on communication and interaction. In addition, elements from situated learning in a community of practice are applied, with a focus on authentic activities and collaborative problem solving. The Community of Inquiry (COI) framework is used. The Community of Inquiry framework [1] represents a process of creating a deep and meaningful (collaborative-constructivist) learning experience through the development of three interdependent elements – social, cognitive and teaching presence. Then, self-regulation is fostered by asking participants to define personal learning goals at the beginning of the course, by requiring weekly reflections on the individual learning progress, and finally, by organizing regular peer-feedback during the course.

In particular, all online courses follow the same basic structure. Each course first contains meta-information, inclusive of information on learning objectives, content, instructor and literature. Then, each course consists of a set of weekly learning activities. All programme participants must complete up to seven learning activities each week. The structure of the learning activities are based on the concept of 'E-tivities' by Gilly Salmon [2]. Based on this concept, each learning activity comprises a description of the intended learning objectives, the tasks to be completed by the participants and the expected interaction (e.g. discussion of results in a forum). The learning activities are not meant to test competencies, but to allow the students – alone and in interaction with others – to accomplish the intended learning objectives. Examples for learning activities include: Reading literature on a given concept, preparing and presenting a case study, searching for additional literature, contrasting different approaches, criticizing a given approach, conducting a statistical analysis, or designing a database. For each learning activity, the instructor provides the needed materials (presentation, paper, book chapters, or websites). The course learning management system is the open source eLearning platform Moodle (<https://moodle.org/>).

The whole communication in the online courses is asynchronous. Students work on the learning activities and post messages or reply to messages at any time they want. The instructor is present each day, assists with questions and problems, provides tailored input and summaries to the discussions and provides feedback on student submissions.

## RESULTS

Three online-based pilot courses were conducted in 2016-2017 [3-5]. A thorough evaluation was completed for all three courses (publications are provided upon request; please contact [elske.ammenwerth@umit.at](mailto:elske.ammenwerth@umit.at)).

The comprehensive evaluation for these three courses showed that the instructional strategy was successful in facilitating a trustful, interactive and collaborative learning environment. This is visible both in quantitative data (e.g. very good students' evaluations, high number of students' posts, high indicators for social presence and cognitive presence) as well as in the qualitative data (e.g. from student exit interviews). Learning processes seemed to be quite intensive and engaged.

The chosen instructional design specifically addressed the needs of part-time students, such as the exploitation of previous knowledge, application of new knowledge, interaction with other students and learning independent of time and place.

## OUTLOOK/LESSONS LEARNT

We see a strong need in offering academic qualifications related to health IT and HIM for health care professionals on various levels. First, basic modules must be included in medical and nursing programs. On the next level, short in-depth intensive courses must also be offered, to allow health care professionals to better understand the fields of health IT and HIM. Finally, universities are encouraged to offer full academic qualifications (such as professional master degrees) to allow health care professionals to become experts in health IT and HIM. UMIT will launch the master’s degree programme in 2018, and we expect to yield large interest in the programme.

It is important, however, that these programmes for health care professionals are based on a management-oriented and organizational-oriented (and not technically oriented) approach to health IT and HIM topics, to allow physicians and nurses to get into the field, without the need to acquire in-depth technical skills.

## References

- [1] Community of Inquiry (COI) Framework: <https://coi.athabasca.ca/coi-model/>
- [2] E-tivities, Gilly Salmon: <https://www.gilysalmon.com/e-tivities.html>
- [3] Ammenwerth E. [Envisioning changing role of university teacher in online instructional environments](#). The All Ireland Journal of Teaching and Learning in Higher Education 2017; 9(3): 3121-9.
- [4] Ammenwerth E, Hackl WO, Felderer M, Hörbst A. [Developing and evaluating collaborative online-based instructional designs in health information management](#). Stud Health Technol Inform. 2017; 243:8-12.
- [5] Ammenwerth E, Hackl WO. [Monitoring of Students' Interaction in Online Learning Settings by Structural Network Analysis and Indicators](#). In: Randell R, Cornet R, McCowan C, Peek N (eds.): Informatics for Health - Proceedings of Medical Informatics Europe (MIE 2017). Stud Health Technol Inform 235. 2017. pp. 293-297.

## Case Study Checklists

Checklist of eHealth topics (competencies)	Apply? Yes/No	Describe how topic applies to your organization/case study
<i>Role of “Peopleware”</i> : 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	Yes	<i>This topic is covered in the HIM curriculum.</i>
<i>Role of inter-professional approaches</i> : inter-professional versus mono-professional training and learning activities. What subjects lend themselves to inter-professional vs. mono-	Yes	<i>This topic is covered by the interdisciplinary approach of the HIM curriculum.</i>

professional classes, learning environments and similar topics		
<i>Role of healthcare data sciences:</i> 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	Yes	<i>This topic is mostly covered in the HIM curriculum (with the exception of clinical decision support).</i>
<i>Fusion of medical technology &amp; informatics:</i> software as a device, smart devices, automatic data acquisition via devices, risk and safety management	No	<i>This topic is partly covered in the HIM curriculum.</i>
<i>Role of process and workflow management:</i> clinical and administrative processes, information continuity and information logistics, management of processes, workflow management systems and similar topics	Yes	<i>This topic is covered in the HIM curriculum.</i>
<i>Role of ethics, legal and data protection issues:</i> ethics and IT, legal requirements, data protection and information self-determination, data safety and similar topics	Yes	<i>This topic is covered in the HIM curriculum.</i>
<i>Role of learning and teaching:</i> 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	Yes	<i>This topic is covered by the overall organization of the HIM programme. Students get a three-day introduction on how to study in the programme and also receive an analysis of their personal learning strategies.</i>
<i>Role of management related topics in health informatics and IT:</i> 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	Yes	<i>This topic is covered in the HIM curriculum.</i>
<i>Role of technology:</i> information and communication systems, telemedicine, telematics, assistive technologies, mHealth, life-	Yes	<i>This topic is partly covered in the HIM curriculum.</i>

cycle-management including systems development/engineering		
<i>Role of consumers and populations:</i> consumer health informatics, public health informatics	No	<i>This topic is not explicitly covered in the HIM curriculum.</i>
<i>Role of Research:</i> information management in research, data analytics	Yes	<i>This topic is partly covered in the HIM curriculum.</i>
<i>Role of interoperability:</i> systems integration, IT standards, terminologies and classifications	Yes	<i>This topic is covered in the HIM curriculum.</i>

**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?  
 Not at UMIT

*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?  
 Not at the moment; but we at UMIT did a lot of research on user acceptance of clinical information systems (CIS) in the recent years.

*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?  
 Yes – both bachelor and master programme in nursing sciences at UMIT cover topics related to HI.  
 In addition, we offer a three-day intensive course for nurses that covers foundations of HIM.

*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 that I am aware of.

*Engaging women:* Are there any activities to attract female students in eHealth/health informatics or employ female health IT staff?  
 Not at UMIT.

*Adjusting job descriptions and enable continuing education:* Are there any activities to adjust job descriptions, e.g., for clinicians, that include health informatics competencies (also proper use of health IT/eHealth systems) and are there activities to support staff updating and upgrading their health IT related skills and knowledge? This topic is mainly related to provider organisations and to IT vendors.

Not that I am aware of.

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

Yes, this is part of our ongoing curriculum development in HIM.

*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?

HIM is a new, online-based, fully accredited master programme in health information management at UMIT.

*Informal caregivers:* Are there any educational activities to teach health IT usage to informal caregivers, e.g. for assistive technologies?

Not at UMIT.

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

Not that I am aware of.

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

Not that I am aware of.

*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?

Not that I am aware of.