



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: Massive Open Online Course for Flexible Competency Development in Primary Care

University of Oslo, Norway

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TITLE Massive Open Online Course for Flexible Competency Development in Primary Care

AUTHORS

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Lene Lunde, RN, MNsc, Researcher, the University of Oslo, Faculty of Medicine, Institute for Health and Society, serves as the Project Manager for the MOOC project. She participated in the content development process of the MOOC and oversaw the development process for the pilot testing.

Hilde Eide, RN, MA (Psychology), PhD, Professor and Director, Science Centre of Health and Technology, University College of Southeast, Norway. Her research activities cover mobile health (mHealth) interventions for persons with chronic pain, communication in health care and innovation processes related to implementation of welfare technology and digital surveillance in primary care. She contributed to planning content of the MOOC in participatory workshops, specifically scaffolding learning objectives for the nurses.

Elin Olaug Rosvold, MD, PhD, Professor, University of Oslo, Faculty of Medicine, Institute for Health and Society, and Associate Dean of Studies, Faculty of Medicine, University of Oslo, Norway. Her research activities involve competency development in primary care, interdisciplinary collaboration and curriculum development. She is the Principal Investigator (PI) for the project.

ORGANIZATION

University of Oslo (UiO) was founded in 1811 as the first university in Norway. UiO is the highest ranked institution of education and research, and the largest public institution of research and higher learning in Norway. The Faculty of Medicine's teaching and research activities are extensive, from basic biomedical subjects to clinical subjects and health subjects, with a clear international profile. The Institute of Health and Society (Helsam) has a strong research portfolio in primary health for management, practice and professional development. Helsam hosts UiO:eColab, advanced e-infrastructure to study technology mediated collaborative team work and complex patient-centered interventions in primary care. eLearning resources supplement our efforts to stimulate skills development and encourage evidence-based practice with sound decision-making. The MOOC project is an example of an innovative project that builds and expands on previous work to establish comprehensive digital learning opportunities for interdisciplinary competency development in primary care; this extensive collaboration with primary care is an invaluable resource for the MOOC project.

University College of Southeast Norway (USN) is Norway's second largest state-owned university, measured by the total number of students enrolled. USN aims to have a regional foundation, and with eight campuses, we have a strong presence in one of Norway's most exciting and dynamic regions. USN hosts a PhD-program in Person-Centred Health Care – the first in the world. USN has established the Science Centre Health and Technology at the Faculty of Health and Social Sciences to establish experiences that support future development of a sustainable health care system. The Centre is a lab and a meeting place, focusing on the affordances given by technology and digitalization to support needed innovation in the health and welfare system. Collaborative processes between the person in need of services, the industry, hospitals, municipalities and interdisciplinary collaboration between faculties are at the core of the Science Centre's activities.

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BACKGROUND

Health care is evolving with new treatments, patient centeredness and cost containment that lead to new approaches. We observe that the responsibility for increasingly complex patient care is migrating to primary health care. Such transitions are fueled by advancements in eHealth. Ensuring a sufficiently digitally-competent workforce with updated clinical skills will be crucial to maintain patient safety during these transitions. A core concern and area for workforce capacity to meet challenges in the new care environment is the development of new skills, including digital literacy, and to ensure efficient collaboration and information sharing among health care practitioners with different backgrounds that will work together in interdisciplinary primary care teams [1]. A core premise and growing management responsibility is to ensure that the health care practitioners that attend to the increasingly complex clinical problems presented in primary care know what to do, can efficiently use information in the team and master the tools. This is a paradigm shift from previous practices. Inherent in the paradigm shift is task shifting and the active use of digital resources to ensure development of sufficient workforce capacity in primary care. These envisioned transformations will only happen and be successful if we invest in workforce development to meet the increased need for learning opportunities that acquire competencies to a) use the necessary eHealth tools and to b) perform high quality collaborative care.

Our project was motivated by an interest to exploit new technological platforms that could facilitate learning experiences across sites; be it a home care setting, nursing home, community health center and/or general practitioner (GP) office. Task shifting is noted by the World Health Organization (WHO) as one way for the public health community and national governments to address issues head-on. It deals with increasingly complex patient situations, which require us to focus on lifelong learning for all health care practitioners, and identifies a focus on strengthening interdisciplinary team collaboration in primary health care and maintaining patient safety as an opportunity and starting point. The MOOC set out to stimulate advancement of digital skills using an online platform to foster shared understanding, cooperation and targeted communication in primary health care. In addition, the MOOC works to ensure interdisciplinary collaboration based on better and more appropriate decision-making, early intervention and prevention of unnecessary hospitalization from primary health care.

STATUS/CURRENT DEVELOPMENTS

This case study combines an interest to use innovative eLearning solutions, like a MOOC, with a commitment to offer opportunities for workforce capacity building that includes life-long learning offerings based on authentic and increasingly challenging practical problems. In sum, this will increase workforce digital skills and the capacity to deal with more complex patient problems in primary care.

We developed a MOOC titled “*Klinisk undersøkelse og tverrfaglig samarbeid i primærhelsetjenesten (KlinPrim)*” This translates to English as “*Focused, Clinical Assessment and Interdisciplinary Collaboration in Primary Care*”. The MOOC seeks to develop eHealth competencies and workforce capacity building in terms of learning new clinical skills for systematic assessment and interdisciplinary collaboration. This is reflected in the MOOC’s learning objectives, expressed as gained experience, knowledge and skills in a) systematic observation of vital signs; b) triage with relevant observations and assessments to determine severity and urgency; c) physical examination and comprehensive physical assessment of older patients; and d) in-depth focus on heart and lungs, after completion of the modules in the MOOC. Inherent in these goals is to gain proficiency with the use of digital resources.

The content for this MOOC was prepared during several participatory workshops with project partners in primary care. After prioritizing the content areas, we invited a wide range of health care practitioners to provide relevant examples of common and challenging situations. They participated in developing real-life scenarios to illustrate authentic situations the learners could use as starting points in the MOOC. These were used as the basis for clinical assessment activities, communication of key findings in a standardised way to ensure interdisciplinary interpretation and question and answer (Q&A) or quizzes.

Our hypothesis is that through workforce development and specifically digital resources to enhance health assessment skills, we will contribute to an increase in the staffs’ capacity to differentiate common clinical issues in primary health care and start necessary interdisciplinary collaboration to prevent deterioration of the simulated patient’s condition.

ACTIVITIES/MEASURES

The KlinPrim MOOC was developed with five modules:

Module 1, *Introduction*: introduces the participants to the simulated patient Sverre Jensen and his medical health history. In addition, participants are introduced to important elements when collecting medical health history.

Module 2, *Vital signs*: teaches the participant systematic observation of the patient in prioritized order through Airways, Breathing, Circulation, Disability and Exposure (ABCDE). Vital signs include measurements of oxygen saturation, respiratory rate, pulse, blood pressure and temperature.

Module 3, *Deteriorating clinical condition*: the objectives are to detect and determine severity and urgency of the patients’ clinical condition (triage) by systematic assessment and evaluation, and contribute to interdisciplinary interaction. The participants are introduced to three scenarios dealing with the patient, Sverre Jensen’s, deteriorating state: urinary infection, deep vein thrombosis and stroke.

Module 4, *Physical examination*: addresses all the elements in a comprehensive clinical examination of patients (head to toe).

Module 5, *In depth heart and lung*: contains training and assignments related to the heart and lungs, such as placement of stethoscope during auscultation, recognizing heart and lung sounds and how to correctly place electrocardiogram (ECG) electrodes.

In each of the modules, we are engaging the learners in video-based introductions, readings and self-assessment to evaluate achievements of the different learning outcomes. Each module has several assessment options:

MCQ (Multiple Choice Questions) for topics where the learners should choose one or multiple correct answers from the list of available alternatives for questions to assess achievements relevant to the topic in the module. This could be an interpretation of facts, new knowledge applied for evaluation of situations, explanation of cause and effect or assessment of results.

Drag'n drop based interactions consist of a set of two or more possible answers that the participants are asked to rank in a particular order, or drag to the correct box. This is a variation of MCQ that contributes to create logical connections in a visual way.

Discussion topics / threads are text assignments where the learners are asked to provide a comprehensive answer to a particular question or specific issue. Once the assignment is answered and shared in the thread, the learners can get access to the other participants' responses and proposed solutions. They are encouraged to further discuss the issue/topic with the other participants for added value.

In sum, the assessment activities are selected to engage the learners in useful activities relative to the learning outcomes.

In November 2017, representatives of the interdisciplinary team of health care professions and students in health care education programs participated in a pilot test of the MOOC. The pilot test helped evaluate the competencies needed to use the system (eHealth competencies) and the MOOC's effectiveness to achieve the clinically oriented learning objectives. The pilot also enabled us to better understand the usefulness, applicability and resources required to complete the modules in the MOOC. The purpose and main task in this pilot was to understand how well the assignment fitted the content and to assess the level of difficulty and usefulness for learning.

Our pilot test indicated that the included content was seen as relevant. Participants reported an average of between 20-90 minutes to complete each modules. Average time used in each module was highest in modules 3-5, as expected due to comprehensiveness and complexity of the content. The time spent in each module indicates how much time the participants used to go through the content without answering the assignments fully, with a higher time spent in each module when completing the assignments. The assignments were rated as useful and appropriate to the content and expressed huge potential for interdisciplinary collaboration. They described the topics included in each module as relevant and highly useful for themselves and for their collaborators. The level of difficulty varied due to profession. Participants with lower educational degrees rated some of the assignments as more difficult. Combining the use of videos, audio files and text made the content interesting and enhanced the learning experience. The use of realistic examples and scenarios further contributed to the content being rated as both interesting and relevant.

Feedback from the participants indicates that the MOOC has the potential to contribute to work place discussions between interdisciplinary healthcare workers, as well as preparing health care students for clinical rotation because of the inclusion of realistic and relevant topics. Feedback also suggests that knowing that your healthcare colleagues had also participated in the MOOC would be reassuring and could stimulate more precise patient discussions.

Based on the participant's feedback, useful suggestions for improvements were identified. One suggestion was to include additional information defining what the interdisciplinary teamwork is and how to interact between the different healthcare groups. Other suggestions for improvement included responsible use of antibiotics, development of assignments based on patient cases and use of more theory and explanations in some areas. No suggestions were made to remove or replace any of the content.

CHANGES

This MOOC represents the next step forward from traditional, institution-based eLearning resources. As we created the MOOC, our intention was to include more peer-support and collaborative learning activities to foster skills in use of and navigating in digital environments. How well the changes work towards goal achievements for the learners will be further investigated in the upcoming, full-scale six-week test (taking place late spring 2018) where health care practitioners will take the new course for workforce capacity building and as preparation to primary care clinical rotation for the bachelor of science (BS) level nursing, masters level, advanced nurse practitioners and medical students.

The full scale pilot will provide more information about 1) the usefulness of the different modules, 2) ease of use, 3) advantages and disadvantages of using a MOOC as a strategy for learning, 4) the potential for team training and 5) importance of digital skills. For health care practitioners, the MOOC will be a lifelong learning and capacity development program, and for the students it will also serve as an introduction to key areas of primary care and expectation for skills they can practice and harness during clinical rotation.

ANTICIPATED RESULTS

We are anticipating that the learners will expand their eHealth competencies from working in digital environments, and that working with relevant authentic problems will stimulate their capacity to deal professionally with more complex clinical problems in primary care. We also anticipate a more efficient collaborative practice that stimulates the quality of work life and maintains patient safety when more advanced level care is required outside of specialized institutions; in primary care facilities and with the home as a site for care activities.

OUTLOOK/LESSONS LEARNT

Since the MOOC provides a completely new platform for learning and competence development, we believe efforts in and facilitation of planning is tied to increased interdisciplinary collaboration focused on primary care. Trying to accommodate learning experiences for a heterogeneous group, in terms of educational background, professional responsibility and digital skills, represents significant challenges for design, selection of material and deployment of a digital learning resource. Feedback from the pilot supports the conclusion that all testers, representing the diverse group, could use the digital resources, and found the material useful for themselves and others to improve collaboration and exchange of information necessary for collaborative care. We also believe that the modules included in the MOOC will

be useful in preparing for clinical rotations in healthcare education. Systematic assessments of contributions to learning and competency development are necessary. We also find it interesting to further explore how and to what extent digital environments like this MOOC can help further sustain eHealth competencies.

References

- [1] The Norwegian Ministry of Health and Care, *The primary health and care services of tomorrow – localized and integrated* Meld. St. 26 (2014-2015), white paper to the Norwegian Parliament

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	No	<i>Participatory workshops created awareness, defined approach and content, also eHealth competencies. On-going transitions and strategies to meet them involve “Peopleware”</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-professional classes, learning environments and similar topics	Yes	<i>Focus on efforts to improve interdisciplinary collaboration, in the design of the modules. Content is relevant for all, the depth and sophistication varies according to professional background</i>
<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>Use of check lists and assessment instruments to facilitate for interprofessional collaboration and communication</i>
<i>Fusion of medical technology & informatics:</i> software as a device, smart devices, automatic data acquisition via devices, risk and safety management	No	<i>Does not address</i>
<i>Role of process and workflow management:</i> clinical and administrative processes, information continuity and information logistics, management	Yes	<i>In the topics, there are models of clinical processes and information continuity</i>

of processes, workflow management systems and similar topics		
<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	No	<i>Inherent in the platform</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>Engaging the learners through blended learning styles, interdisciplinary</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	No	
<i>Role of technology:</i> information and communication systems, telemedicine, telematics, assistive technologies, mHealth, life-cycle-management including systems development/engineering	No	
<i>Role of consumers and populations:</i> consumer health informatics, public health informatics	No	
<i>Role of Research:</i> information management in research, data analytics	No	
<i>Role of interoperability:</i> systems integration, IT standards, terminologies and classifications	No	

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?

We offer a master level course in Innovative Practice Development, but nothing specifically with teaching teachers in healthcare.

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?

Yes, at the University of Oslo.

Yes, we research user acceptance and satisfaction.

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?

We offer a master level course in Innovative Practice Development and a PhD course in digital collaboration.

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?

N/A

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

N/A

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 organisation and also, to IT vendors.

N/A

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

The activities described throughout the study.

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?

This case study is an example of advanced eLearning course.

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

In the country, yes, but not in our institution specifically.

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

It is a problem that most of the few existing HI programs do not discuss the specifics of healthcare, professional roles and responsibilities in an eHealth supported environment appropriately. There is a bias to informatics.

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

Our project is supported by a national initiative to create more digital resources for life-long learning and training.

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?

Primary care includes all the examples above.