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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: Developing a New Masters Level Module on Digital Technologies and Information for Health Care Delivery

School of Health Sciences, University of Brighton, United Kingdom

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TITLE Developing a New Masters Level Module on Digital Technologies and Information for Health Care Delivery

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ORGANIZATION
The University of Brighton is one of the most popular universities in the United Kingdom (UK) in terms of student applications. It has a distinguished history going back to 1859 when its first classes were established in the Brighton Royal Pavilion. It was the first university to be named the Sunday Times' 'University of the Year' and it won the 'Outstanding contribution to the local community' title from the Times Higher Education Awards. In 2011, the university won further international recognition for its community projects through the MacJannet Prize for Global Citizenship. An independent report in 2014 calculated that the University of Brighton contributes close to £700m annually to the economy and supports more than 7,000 jobs. Over 21,000 students study in University of Brighton programmes, from foundation degrees to doctoral research programmes. Courses span a wide range of academic and professional disciplines, and the university receives national and international recognition for its research activity. The University of Brighton was ranked 27th out of 128 research institutions in the UK for its world-leading research impact, placing it in the top 25% in the sector and is a top 10 UK university for world-leading research impact in allied health professions, nursing and pharmacy. Nursing education belongs to the School of Health Sciences. The School also provides education to approximately 3,000 students studying midwifery, physiotherapy, occupational therapy, podiatry, paramedics and public health at the bachelors, masters and doctorate levels.

BACKGROUND
In just 20 years, the UK's population will include 3.5 million people over the age of 85, and many will be over 100 [1], creating challenges for the healthcare sector. To prepare for this challenging future, the Care Quality Commission, Health Education England, National Health Service (NHS) England and Public Health England published in October 2014 the 'Five Year Forward View' (FYFV). FYFV identifies coming changes in patients' health needs and personal preferences, in treatments, technologies and care delivery and in health services funding growth [2]. To address these changes and challenges, the document set a 'Triple Aim' focusing on three gaps: the health and wellbeing gap, the care and quality gap and the funding and efficiency gap. The FYFV committed to a national focus on the key systems that provide the 'electronic glue' which enables different parts of the health care system to work together to harness new technologies. The report was supported by the personalised health and care 2020 strategy, which outlined ambitious plans to deliver a step-change in how health and care services use technology. These were followed by a report from the National Advisory Group on health information technology (IT) in England [3] which argued that the NHS would be unable to reach its goals without digitising effectively, and put forward principles for delivering a fully digitised NHS. These ambitions recognise that the national health and care bodies play an important role in supporting technological innovation, particularly in ensuring interoperability - the ability of IT systems and software applications used in health and care services to communicate, exchange and interpret data and work together. As the health and care system increasingly

moves towards planning and delivering services at whole systems level, this will be ever more important. The achievement of this vision must be based on a collaborative approach, rather than a centrally driven plan or strategy. The solutions and services must be defined by the service users, the carers and the care professionals, and not by technology ideologues. Following these developments, in May 2016, NHS England published a framework [4] for nursing, midwifery and care staff under the title 'Leading Change Adding Value', highlighting the crucial role that nursing, midwifery and care staff have in this drive. In the new suggested framework, which includes ten commitments, the 10th states: 'We will champion the use of technology and informatics to improve practice, address unwarranted variations and enhance outcomes'. According to NHS England, the way to address the commitment is, among others, by developing the skills needed in a technology-literate workforce.

STATUS/CURRENT DEVELOPMENTS

Nursing education in the UK is regulated by the Nursing and Midwifery Council (NMC) which sets the standards of education, training, conduct and performance of nurses and midwives. In May 2017, NMC launched a new education consultation [5] giving patients, the public and healthcare professionals the opportunity to shape the future of nursing. The consultation sets out proposals for a new education framework for nursing and midwifery education. The proposed framework details a range of new outcome-focused standards for education institutions and practice placement partners. Responding to the consultation, the Royal College of Nursing (RCN) [6] highlighted the importance of current technology and digital literacy and assessment of online resources to support promotion of self-management, stating that the effective use of information and current technologies is a key enabler in delivering health and social care, now and in the future. The impact of technology and the potential that it has to transform care is a professional issue touching on care delivery, practice, education and research. Since 2015, Dr. Theo Fotis articulated the need of developing a future nursing workforce named 'Digital Nursing' [7, 8]. On this ground, Dr Fotis worked with Principal Lecturer, Patrick Saintas, Health Sciences, University of Brighton, to produce the final module template which is presented in this case study below. They revised an older version of a module that Patrick Saintas had already introduced a couple of years ago, resulting in the development of the content titled 'Digital Technologies and Information for Health Care elivery'. The module is interprofessional, aiming for health care professionals with a variety of backgrounds (doctors, nurses, pharmacists, physiotherapists, occupational therapists, podiatrists) studying at the master's level.

ACTIVITIES/MEASURES

Following university procedures, we consulted with local stakeholders, NHS, patients and computing specialists (from the computing and engineering school at the university), the educational module content was finalized (see *Table 1*). The School of Health Services at the university, which always addresses the needs of the future workforce while actively encouraging an innovative environment, reviewed the case for support as well as content before approving the delivery of this new postgraduate module.

Table 1. Module Template

MODULE DETAILS	
Module title	Digital Technologies and Information for Health Care Delivery
Module code	NA7159

Credit value	20
Brief description of module content and/ or aims Overview	This module addresses the recent recommendations from the National Advisory Group on Health Information Technology [3] on the need to raise the level of digital education of health care professionals. The underpinning rationale for this is based on the need to facilitate the development of knowledge and skills for both leaders and front line service providers to foster the adaptive, transformational change needed in the proposed phase of health service digitization. Though the examples in the module delivery will be drawn from the NHS in England, the contents of this module may equally be applicable to International care service. This module can also be accessed by international students.

MODULE AIMS, ASSESSMENT AND SUPPORT	
Aims	<u>This module aims to:</u> Appreciate the importance of information management and the complex issues involved with data sharing in health care delivery. Be cognizant of the issues involved in the collection, storage, classification, analysis, manipulation and presentation of data for health care management and delivery. Be appraised of the ethical and legal implications of telehealth and telecare and the policies needed to safeguard privacy and confidentiality in health information archival and retrieval systems.
Learning outcomes	<u>On successful completion of the module the student will:</u> 1. Critically evaluate a range of digitized technologies used to harness quality care, perspectives and outcomes for patients and service users 2. Critically evaluate the legal and ethical issues involved in safeguarding health information 3. Critically evaluate the advantages and disadvantages of computerized health care records 4. Critically evaluate the underlying trends driving the need for more effective health care information management
Content	• Introduction to health care information systems and their use in information management (Health Information Archival and Retrieval Systems) • Complexity, adaptive change and the age of digital transformation

	• The purpose and rationale for health care information management • Health Information Media (paper and electronic) • Data capture tools and technologies (health record tools and documentation) • Data quality and integrity • Information governance • Security, privacy and confidentiality issues • Data protection and medical records acts • Clinical classification systems • Electronic Health Records (EHR), personal health records (PHR) and their implications • Telehealth, telemedicine and telecare • Evidence based informed decision-making • Analysis and presentation of data for quality, risk management and other patient care related studies

Teaching and learning activities	
Details of teaching and learning activities	It is intended that this module will be delivered using a blended learning approach with some face to face, as well as the use of web 2.0 functionalities, such as blogs and wikis to engender collaboration and sharing of materials amongst the facilitators and module participants. Participants will be required/expected to explore within the care delivery settings, systems in place to manage health care information and to integrate the contents of the module to the realities of practice through reflection. Students will be expected to participate in four online journals (blogs). Failure to meet this, at least three times, will normally result in students not being eligible to submit the assignment.

Allocation of study hours (indicative) *Where 10 credits = 100 learning hours*		**Study hours**
SCHEDULED	This is an indication of the number of hours students can expect to spend in scheduled teaching activities including lectures, seminars, tutorials, project supervision, demonstrations, practical classes and workshops, supervised time in workshops/ studios, fieldwork, external visits and work-based learning.	60

GUIDED INDEPENDENT STUDY	All students are expected to undertake guided independent study, which includes wider reading/ practice, follow-up work, the completion of assessment tasks and revisions.	140
	TOTAL STUDY HOURS	**200**

CHANGES

This is the first version of the module. As it is scheduled to be delivered on Semester 2 in the academic year 2017-2018, the evaluation will follow the completion and final results of the students.

RESULTS

The new module is scheduled to be delivered on Semester 2 in the academic year 2017-2018. It will be part of the available modules at the master's level, suitable for any pathway on Master of Science (MSc) Health studies (Advanced Practice, Health Promotion, Health and Education, Health and Management, Community Nursing). As such, this shared delivery module will provide students with the opportunities to explore the issues surrounding the application of a range of emerging technologies in effective health care information.

OUTLOOK/LESSONS LEARNT

The development of this new module followed the university's flow chart/process. The process focuses initially on the rationale and market for proposed courses, their financial impact on the institution and their fit with University and School strategies. There were quite a few lessons learned through the process of development. Exploring the gap of knowledge and scoping the need in the education market was very important to calculate the potential financial impact on the institution. At the very initial stage of development, we organised consultation stakeholder (healthcare providers, university colleagues and professional bodies) meetings. The early stakeholder engagement was crucial to both explore the needs and explain the rationale of providing this education, especially to the health care providers. Moreover, these consultations provided us an insight and understanding of how the health care providers perceived the impact of this education on their workforce skills and quality of provided care.

As this is the first development of a module offered to health care practitioners, receiving the student's feedback will be crucial. Additionally, another marker of success will be the performance of students on the assessments. The future aim is to build on this experience and feedback along with the knowledge developed by the Technology Informatics Guiding Education Reform (TIGER) Initiative towards developing a digital health module for undergraduate nursing, midwifery and allied health professions students.

References

[1] Office for National Statistics. National Population Projections: 2014-based Statistical Bulletin: Version 20/10/2017 https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationprojections/bulletins/nationalpopulationprojections/2015-10-29

[2] Care Quality Commission, Health Education England, Monitor, NHS England, Public Health England, Trust Development Authority (2014), Five Year Forward View.

[3] National Advisory Group on Health Information Technology in England (2016), Making IT work: harnessing the power of health information technology to improve care in England.
[4] NHs England. Leading Change, Adding Value: A framework for nursing, midwifery and care staff. Version 20/10/2017 https://www.england.nhs.uk/wp-content/uploads/2016/05/nursing-framework.pdf
[5] (NMC) Nursing & Midwifery Council. Programme of change for education: Version 20/10/2017 https://www.nmc.org.uk/education/programme-of-change-for-education/programme-change-education/
[6] (RCN) Royal College of Nursing. RCN responds to NMC education standards consultation https://www.rcn.org.uk/news-and-events/news/rcn-responds-to-nmc-education-standards-consultation
[7] Fotis Theofanis: Digital Nursing: enhancing the human touch through technology. 2017 West Midlands Health Informatics Network Conference (WIN 2017)
[8] Digital Nursing and the 'human touch'. Clinical Services Journal. 2016 https://www.clinicalservicesjournal.com/story/19490/digital-nursing-and-the-human-touch

Case Study Checklists

When filling in the above form, please check whether the following topics apply to you or your organization. If yes, please expand upon them. If no, disregard them or convey why they are not applicable.

Checklist of eHealth topics (competencies)	**Apply? Yes/No**	**Describe how topic applies to your organization/case study**
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	*No*	*This content will be covered in the proposed module on which this case study was developed. Post graduate modules at the Masters level on Managing Change (NAM 07). Leadership roles and responsibilities (NAM 52) already addressed the systems approach and also complex Adaptive Systems.*
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	*Yes*	*The big advantage of the School of Health Sciences is that it includes nursing, midwifery, physiotherapy and occupational therapy studies. As such, it encourages the interprofessional approach of teaching (shared delivered sessions) and interprofessional research activity (multidisciplinary teams on research).* *NAM 07 and NAM 52 modules are targeted to Health and Social care professionals as well as International students with health and social care experience.*

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	*Yes*	*Whilst the answer is yes, this is at the foundational education level for registered nurses such as collection of data through physical measurements and decision making through simulation.* *Information management is integral to the competencies required of registered nurses. The role of healthcare data sciences is an important component of the contents in the Digital Technologies Health module directed at masters level.*
Fusion of medical technology & informatics: software as a device, smart devices, automatic data acquisition via devices, risk and safety management	*No*	*The intention is to develop an undergraduate shared delivered module including these subjects. This content will be covered in the proposed module featured in this case study.*
Role of process and workflow management: clinical and administrative processes, information continuity and information logistics, management of processes, workflow management systems and similar topics	*No*	*This content will be covered in the proposed module featured in this case study.*
Role of ethics, legal and data protection issues: ethics and IT, legal requirements, data protection and information self-determination, data safety and similar topics	*No*	*This content will be covered in the proposed module featured in this case study.*
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	*Yes*	*Currently, there is a variety of learning and teaching styles across the school and university in total (online, blended, face-to-face) which is supported by a dedicated team of Learning Technologies Advisers. Additionally, the university invests a lot of resources on new technologies for teaching.* *Blended learning and the use of e-portfolios for assessment purposes are important components of the module.*
Role of management related topics in health informatics and IT: principles of management,	*Yes*	*The identified contents are delivered via the NAM 07 – Managing Change module and also*

strategic management, stakeholder and change management, leadership, financial management, risk management, quality and safety management, resource planning and management and similar topics		*the NAM52- Leadership roles and responsibilities module. Students who have studied these modules have sometimes undertaken their dissertation, for example, on the implementation of web services within an intensive care unit (work-based project), the implementation of EHRs in rural areas in Saudi Arabia and also within the Ukraine health care system (this is currently an assignment being undertaken by a student in the NAM07 module).*
Role of technology: information and communication systems, telemedicine, telematics, assistive technologies, mHealth, life-cycle-management including systems development/engineering	*No*	*This content will be covered in the proposed module featured in this case study.*
Role of consumers and populations: consumer health informatics, public health informatics	*No*	*N/A*
Role of Research: information management in research, data analytics	*Yes*	*There is extensive teaching of these subjects at the School of Computing, Engineering and Mathematics.*
Role of interoperability: systems integration, IT standards, terminologies and classifications	*No*	*N/A*

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?

No

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 there are but not directly related with health. There is an Inclusive Arts Practice Master of Arts (MA) Postgraduate certificate (PGCert) Postgraduate diploma (PGDip) aimed at artists or individuals from related fields who are working in healthcare, education, the arts or the community sector, which aims to equip students with the necessary skills to initiate and manage truly inclusive arts projects in benefit of diverse

and marginalised groups, for example those with learning difficulties or experiencing social exclusion due to economic or health reasons. https://www.brighton.ac.uk/courses/study/inclusive-arts-practice-ma-pgcert-pgdip.aspx

Most of the research is related to education and the utilisation of technology. As an example: Turvey, Keith (2014) iPads in education? A participatory design for professional learning with mobile technologies In: Passey, D. and Tatnall, A., eds. Key competencies in ICT and Informatics: Implications and issues for educational professionals and management. IFIP Advances in Information and Communication Technology, 444. Springer Verlag, Berlin, pp. 106-123.

Dr. Fotis's current research is focused on the development of a community based living lab where citizens will be educated on digital health technologies to provide an area for testing new devices.

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?

None, except the current module.

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?

No

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

The organisation is currently employing female IT staff but doesn't apply to health IT as there aren't any programmes offered as above.

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?

Annually, before the start of the academic year, the university libraries contact the lecturers individually to request an updated reading list which is held also electronically (Talis Aspire platform)

Additionally, every module and course is scrutinised under periodic review every 3 years which requires, among others, updating the reading list.

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?

On a yearly basis, academics have the opportunity to propose amendments to current courses or the development of new courses, which are then reviewed by the school academic scrutiny committees. For any module which is suitable, can be delivered online.

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

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

N/A

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

No

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?

No