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Ubiquitous Adoption of Innovative and Supportive Information and Communications Technology Across Health and Social Care Needs Education for Clinicians

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Abstract. The paper presents the development, use and evaluation of an on-line undergraduate module delivering an academic-led programme of eHealth learning within nursing, midwifery, allied health professional and social work courses. The health information technology competency frameworks are explored along with an overview of the resulting module. The need for an academically led module will be made along with a description of the management required to maintain validity of content materials. A review of student evaluations will be presented. In conclusion the positive change in attitude and understanding of academic staff members towards health information technology through the inclusion of the module across all of the undergraduate courses will be explored.

Keywords. Education, health information exchange, informatics competencies, e-Learning, Nursing Informatics

1. Introduction

The Department of Nursing and Midwifery at Sheffield Hallam University is one of largest providers of nursing and midwifery education in England with some 700 nursing and midwifery students enrolling each year. The three year course for nurses and midwives is delivered 50% within the University and 50% within practice and the successful students complete the course with an academic award (BSc) and a professional award (Registered Nurse (RN)).

In information terms, nurses and midwives are the professional groups who have the most interaction with patients, their relatives and friends. This places nurses and midwives in a unique role amongst clinicians as the vital element link in the information infrastructure within health care. Since the early 1980's there have been many arguments forwarded that confirm the need to prepare clinicians to take an active

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role in the development and use of information and communications technology (ICT), an example is that of Berg [1] in 1982 when she said:

“The choice is there and the time to make the choice is now. The decision must be whether to act traditionally and have change thrust upon the profession [nursing] from the outside or to anticipate this revolution in nursing practice, familiarize nurses with it, and prepare them to take an active part in the introduction of computers into the nursing community”.

It is clear that a decision was not made across the wider nursing bodies at the time and it is only now that the importance of informatics engagement by clinicians has come to the fore through the publication of the Five Year Forward View [2], aligned documents [3, 4] and Leading Change, Adding Value [5] the framework from Jane Cummings, Chief Nurse, NHS England. It is acknowledged that there has been a plethora of suggestions for informatics competencies produced [6, 7] over the last ten to fifteen years but not one has been widely adopted to meet health professionals' needs.

In 2009 Systems of eCare was introduced as an academic-led fully on-line module using a managed learning environment within the Department of Nursing and Midwifery as part of the three year undergraduate nursing course with the following objectives:

- to understand, improve, influence and use new technologies and informatics, including remote care;
- to find the most reliable sources of information to support evidence based practice;
- to engage and guide patients through publicly available information sources;
- to incorporate ICT into patient consultations;
- to manage the nurse patient relationship when the nurse is not physically in the same place as the patient;
- to perform a quick and accurate data entry at the point of care;
- to understand the legal and ethical issues associated with managing and sharing patient information;
- to extract data to support decisions and monitor the outcomes of practice;
- to understand the role of technology in the delivery and organization of care
- to train other users such as patients and carers how to use relevant ICTs [8]

2. Systems of eCare

Systems of eCare 'docks' alongside the current curriculum at points determined by the student's stage of learning, in this way it does not require curriculum re-design. The module is made up of six units, each unit amounting to some 10 hours of study carried out on-line by the student at a time and place convenient to them. The intention being that a student completes one unit per semester (where there are two semesters per year). At the end of each unit, the student undertakes an on-line assessment, the result of which is contained in a printout which the student keeps in their portfolio. The outcome from the unit(s) is one of the issues discussed with the student during their regular Academic Advisor (personal tutor) sessions.

The design of the module uses an asset based model [9] which allows for ease of update in this ever changing domain. The six units cover issues such as health

information exchange, big data and population health, coding and classification, interoperability, information mapping, information intelligence, telematics, pharmacogenomics, nano-technologies and robotics in health care. Each unit is routinely reviewed and updated every three months by knowledgeable health informatics experts to retain meaning and currency. Any significant policy change or innovative development is announced within 24 working hours for all cohorts.

Since the early beginnings in 2009, there are now over 2,500 nursing, midwifery, allied health professional and social work students with 24/7 access to the module. Figure 1 shows the monthly access hits between September 2015 and September 2016.

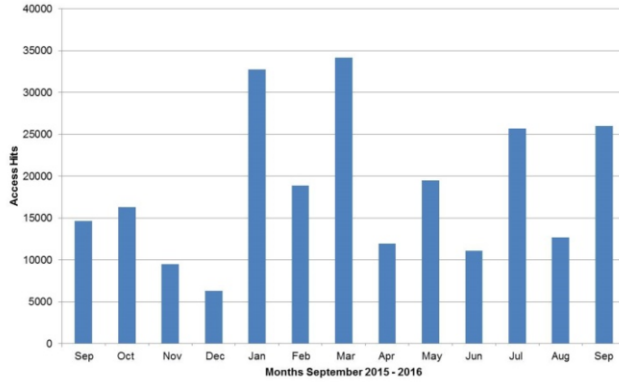


Figure 1. Access hits by students by month

Although access is available all the time, evidence has shown that whilst the students are on placements the number of accesses do reduce by some 43% per month. The module is optional and yet the rate of successful completion of all six units is considerably higher than might have been expected as shown in Figure 2. The dates are the cohort start dates for their three year undergraduate course.

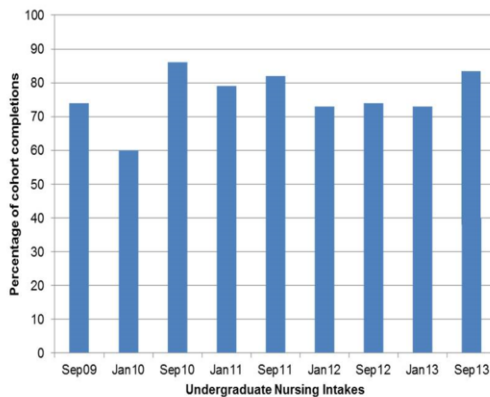


Figure 2. Student completions of all six units

2.1. Structured Evaluation - Key Findings

In September 2015, following an initial pilot to determine the validity of statements, a formal on-line evaluation survey using statements and Likert format response options commenced across the cohorts who had completed all six units. The following results are taken from the students anonymous evaluations for the September 2013 cohort (n=71).

As Systems of eCare sat outside the main curriculum a key question was asked to determine the students' view of where they saw the module in relation to their main course, 76% strongly agreed or agreed with the statement 'It is clear to me how Systems of eCare forms an integral part of my course' with 24% disagreeing or strongly disagreeing. 80% either strongly agreed or agreed that Systems of eCare was intellectually challenging with 63% stating that they found the content and resources in Systems of eCare supported their learning in other modules and assignments. When asked whether the student has been able to apply the knowledge they gained through completing Systems of eCare in their practice 74% strongly agreed or agreed with 23% disagreeing or strongly disagreeing and 1% unanswered.

In response to the statement 'I found that being able to access the online materials at a time that was convenient to me helpful' 96% strongly agreed or agreed with 3% disagreeing or strongly disagreeing and 1% stating 'not applicable'. This is supported by the metrics gathered as part of the managed learning environment as shown in Figure 3.

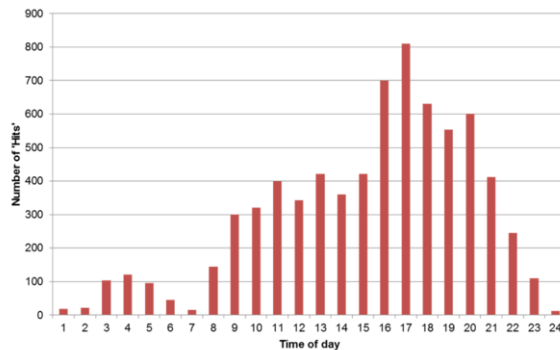


Figure 3. Hits by time of day, one cohort, one month

To measure the effectiveness of the design navigation and structure of the on-line module 56% responded that they did not need to contact the Systems of eCare Tutor at any time during their course.

2.2. Structured Evaluation - Student Comments

The comments ranged from 'Do we really need to know all of this? in such detail? Some of it is very relevant and important but I think 1 lecture on things such as data protection/freedom of information/ computer systems etc would be more effective but i imagine you have to put a certain amount of dedicated time to it, in which case the e learning is far better.' to 'I found this to be a great learning chance to develop knowledge about the NHS' and many points in between.

3. Discussion

It is often difficult to motivate students to engage with learning that is an optional extra to the course yet the results from the student evaluation survey suggest otherwise. The metrics in particular point towards significant access and use of the content. These two points will be considered in further depth during the presentation.

Each undergraduate student is allocated an Academic Advisor for the full period of their course. In the deployment of Systems of eCare it was vital to support academic colleagues in gaining greater understanding of the local and national policies for health and social care ICT. To foster this understanding each Academic Advisor receives regular Systems of eCare progress updates for their students along with an overview of the current unit's aim and learning objectives. With the increased confidence and support through Systems of eCare academic colleagues are now including a wider range of health informatics and telematics in their teaching.

4. Conclusion

Systems of eCare is not compulsory for the students and yet judging by the successful completions it appears to be meeting the students' needs, enabling them to have a robust grounding in health and social care ICT. Through this dynamic academic-led module nurses, midwives, allied health professionals and social workers have been, and continue to be, educationally prepared ready to be active participants in the development and appropriate use of innovative ICT through their professional careers. Future development and research plans will be highlighted.

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