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Research and Education

Health Information Management Education at the Institute of Health Policy and Management of the Erasmus University Medical Center

Abstract: This paper presents a review of the philosophy and content of the Master course of Health Information Management that is being taught at the Institute of Health Policy and Management of the Erasmus University Medical Center in Rotterdam, the Netherlands. We present our experiences of teaching this master course, including its predecessor. Our work, both teaching and researching, can be characterized by the sociotechnical approach of health informatics, which means that we focus on the interrelation of technology and its social environment.

Introduction

Within medical informatics, the recognition of the interplay of information technology and its social environment has become unchallenged. However, the understanding of this interplay is still problematic because its intrinsic complex nature and the fact that researchers and practitioners in medical informatics are not very familiar with the insights of the social sciences and the associated theoretical concepts.

The number of failed implementations of information systems in health care is large (1). The associated costs of destroyed capital and damaged reputations are high. The growing awareness that failures are not haphazard occasions but can be understood and acted upon led to one of us to conceive a postgraduate course for health care professionals who are involved in the design and implementation of information systems. A model has been developed by Aarts, Peel and Wright to establish the contents of the course (2). The resulting master course, in which our department participated, was validated and established by the University of Surrey. Because of changing educational priorities, the University of Surrey decided not to continue the course after two intakes . This change of policy allowed us to take full responsibility for the course and to embed it in our research environment. The course was validated as an Erasmus University master course. We founded a new international network to ensure the European character of the course. Our international partners are Carelink in Sweden and CHIRAD in England. Also we reinforced collaboration with the Institute of Medical Informatics of the Erasmus Medical Center. The collaboration is described in a bit more detail below.

The master course links closely to our research on health information systems in practice. Our institute might be seen as one of the first in the domain of medical informatics to address it in a more structured way.

Based on the same ideas, we have developed elective courses for students of health sciences and a ten day course for Dutch health care professionals and managers. These courses will not be discussed in this paper.

Philosophy

The course contents are based on a model that summarizes how the introduction of information technology in different stages of change repeatedly interact with clinical work in its context of the health care system (3). Each stage has particular consequences for the knowledge, skills and behaviors that an experienced postgraduate must possess to interact effectively with clinical, managerial and informatics colleagues.

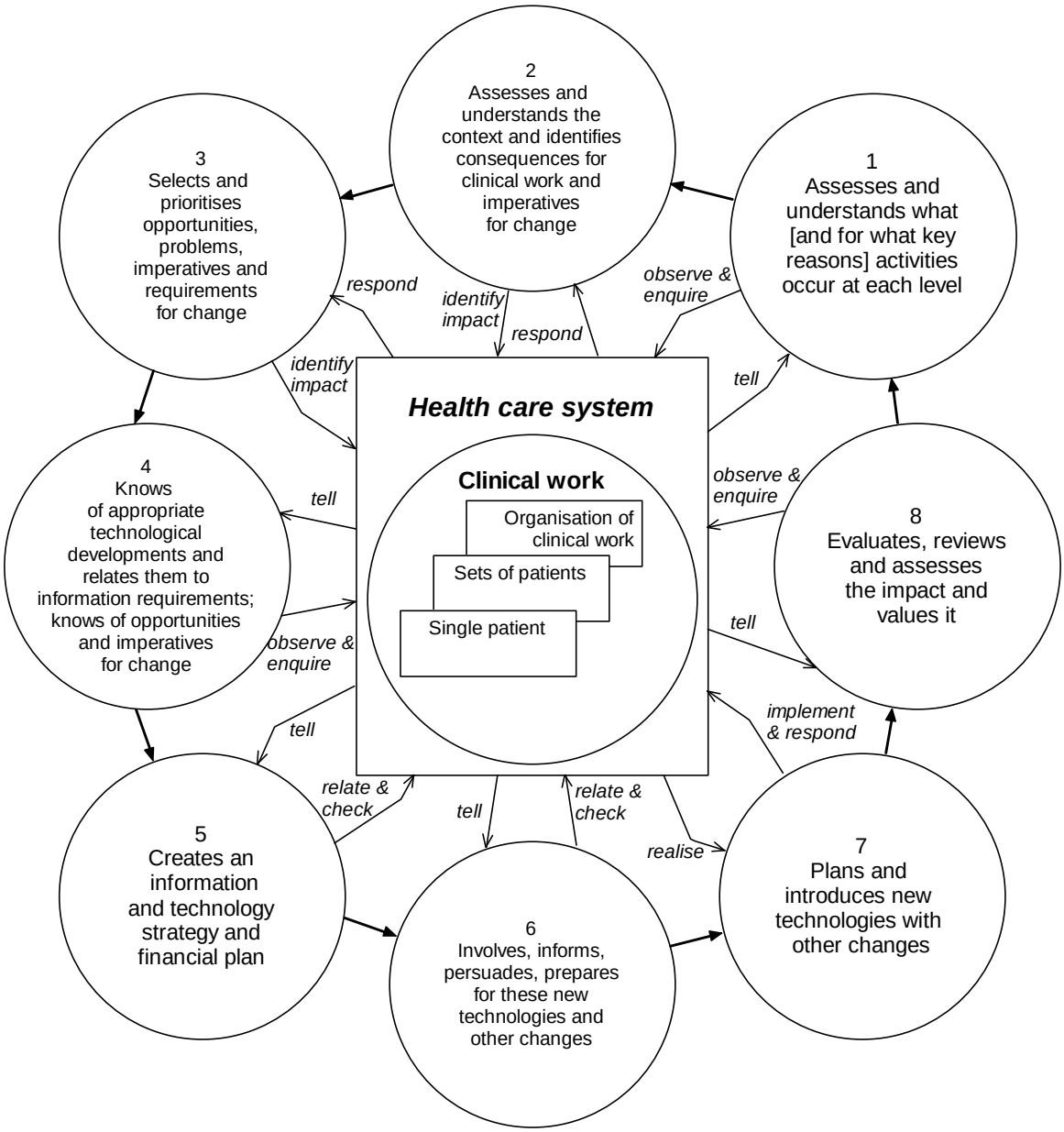

Fig. 1. Model of change and its stages.

The model is cyclic (see Figure 1), which means that managing such a change is a continuous process in health care. In reality, such a process rarely has a clear beginning or end and stages often overlap or iterate. The model might give the impression that the stages are linearly connected. This is not the case. For example, the stage of evaluation is important in each stage of design and implementation. It is vital that senior graduates possess the capacity to manage change in a fluid and demanding environment. Each stage and its interactions with clinical work translates into requirements involving knowledge, skills, attitudes and behaviors.

The stages have been translated into module contents which are described below.

As information technology consists of tools being used by, or at least affecting people, information systems cannot be studied without a focus on the interrelation of the technology and its social environment (4). Socio-technical approaches help to understand these relationships. These approaches have been adopted by our group in various research projects. The socio-technical approaches find their roots in the work of Mumford on information systems design, the Scandinavian tradition of strong worker involvement in the introduction of information technology in the workplace and studies in the field of science and technology studies where researchers recognize that the development of any technology cannot be separated from its social environment (see e.g. (5)). This

thinking is a key element impacting the content and the teaching of the master course.

Target audience

The master course is aimed at professionals in health care. We include clinicians (physicians, nurses and others) who are involved or take an interest in information technology, but also health care managers. We also welcome professionals of consultancy firms and health ICT companies. This mix of professionals can help to increase awareness for the specific problems of clinicians, and clinicians develop understanding for the managerial issues of health care and health care ICT in particular. The students are expected to stand back from their daily activities and reflect on it. Through this form of experiential learning we hope that the combination of reflection and acquiring new insight will provide the graduates with right skills and knowledge to introduce ICT successfully in health care practice. We therefore prefer that students have at least five years of professional experience in health care. The formal entrance qualification is a diploma of higher education in the relevant field (for example medicine, nursing or informatics).

Program

The course is part-time and it is designed so that it can be completed within three years, taking into account a study load of twenty hours per week. The taught part consists of six modules upon the successful completion of a dissertation, the student is awarded the degree of Master of Health Information Management. We deliberately chose this title for the degree because we want to express the central role of the information function in health care. The technology, however important and influential, is supportive to that function.

The table below summarizes the structure and contents of the course.

Module number	*Module title*	*Study Points*	*Lead*	*Delivery location*
1	The health context	4 study points	Institute of Health Policy and Management (iBMG)	Rotterdam
2	Informatics and the changing clinical and managerial environment	4 study points	iBMG	Rotterdam
3	Medical informatics: concepts, technologies and infrastructures	4 study points	Institute of Medical Informatics	Rotterdam
4	Integrated ICT strategies for the health care organization	4 study points	Carelink	Sweden
5	Managing the transition	4 study points	CHIRAD	UK
6	Evaluating the impact	4 study points	iBMG	Rotterdam
-	Dissertation	18 study points	iBMG	

The student study load of each taught module is 160 hours of study including self study and the completion of study assignments. 40 hours of study is equivalent to 1 study point. Each module therefore yields 4 study points. The taught part of the master course totals 960 hours of study or 24 study points. The dissertation values 18 study points, thereby bringing the total study load of the master course to 1680 hours or 42 study points, which is a requisite to grant a masters degree. This would be equivalent to 70 ECTS points in the agreed system for accreditation of European higher education.

Below follows a summary of the student outcomes and contents of the six modules of the master course.

1. The changing healthcare context

The student understands the nature of health and health care, the formulation and realization of health policy, health care funding and the current issues for European health care systems, their commonality and impact.

2. Informatics and the changing clinical and managerial practice

The student appreciates how health care is delivered to the patient, the roles and professional practices of both clinicians and managers, the impact of the changes within the European context on these issues and their ramifications for health information management.

3. Medical informatics: technologies and infrastructures

The student knows about current developments and trends in health care information systems and technology infrastructures, for all forms of health care organizations, including their management, risks and effectiveness.

4. Integrated strategies

The student creates an integrated information and organizational strategy for the health care organization, and undertakes the requirements analysis, including the financial implications, necessary to implement an information and organizational strategy. This module combines stages 4 and 5 of the change model.

5. Organizational development and managing the transition

The student prepares and/or carries out the organizational development associated with the information and technology driven change within the organization; undertakes the innovative and effective procurement, implementation and change management of information, information systems and technologies and their associated organizational development and learning in the health care setting. This module covers stages 6 and 7 of the change model

6. Evaluating the impact

The student evaluates the efficiency and effectiveness of the information change management process and its associated information systems, its value to and impact on: the delivery of care; health outcomes; costs and resource usage; organizational impacts; benefits realized; and the management of the health care organization.

Research methods appropriate for information systems research are included in the course running throughout the modules in order to prepare the students for their dissertation work. The themes covered are research design, quantitative and qualitative methods, and evaluation approaches.

The Institute of Medical Informatics of the Erasmus University Medical Center takes responsibility for module 3. Modules 4 and 5 are respectively taught in Sweden and the United Kingdom. The responsible partners are Carelink, based in Stockholm, Sweden and CHIRAD in the United Kingdom. Carelink contributes to the development of a health information infrastructure in Sweden. CHIRAD is a IMIA recognized academic institute affiliated with King Alfred's College in Winchester.

We encourage students to take on a dissertation research project within their working environment. We think that the student can benefit from the close relationship between information and communication technology and the social environment that he or she experiences on a day-to-day basis. Of course, in such cases precautions should be taken in order to ensure that a dissertation will meet the academic standards of Erasmus University Rotterdam.

Experiences

When we include the experiences gained through the University of Surrey, University of Manchester and Erasmus University collaboration we can summarize the following experiences.

The change model proved to be a sound basis for the program design and the contents of the course. It took about three years between conceiving the ideas and the start of the course in its first form at the University of Surrey. That time paid off, because the program design and contents also did not change dramatically in Rotterdam. However, it is important that the teaching of such a master course is strongly related to a strong research base. These conditions are definitely met at the Institute of Health Policy and Management.

Teaching staff are drawn from the participating institutes and partners. Apart from that we also invite external speakers who bring specific scientific or practical expertise not available in our research staff. We also try to enhance the European dimension by inviting people who bring the European overview of developments in health care and can place local issues in an international context.

The students come from different countries of Europe. Countries represented are Iceland, Ireland, United Kingdom, Sweden, the Netherlands, Luxemburg, Switzerland and Italy. With

no exception, the students all combine learning with a busy working life. They represent the groups that we targeted on well. Among the 31 students, there are 14 belonging to the group of physicians and nurses and the rest are managers, and/or consultants with ICT-responsibility.

The course format suits the students well. For a module they travel to Rotterdam (or other places where the partners are located), spend a week following lectures and other educational activities and take home study assignments. They remain connected with us and their fellow students through the Internet. We have created a special web-based electronic learning environment for communication, document delivery, and where feasible, thematic discussion groups. We can monitor the progress of the student while he or she is taking part in the course work. It becomes more difficult when a student is doing the dissertation work alone and regular work may take precedence. We hope that through the Internet we can support the student to remain disciplined to finish the dissertation. Other help can come through peer support of the fellow students.

As it is often the case with postgraduate courses, students form their own networks for the exchange of experiences and ideas. They assume a critical but positive attitude towards the contents, the teaching and organization of the master course. A common denominator is their expectation that (invited) speakers relate the contents of their presentations to European developments.

Conclusions

We believe that we established a unique master course both with regard to the contents and audience. The core of the master course is the intertwinement of information and communication technology and the social environment. A deep understanding of this relationship is necessary for the successful design, implementation and evaluation of the information function in health care. The target audience is professionals in health care. We deliberately address their needs because through their experience they are often instrumental in or even responsible for introducing innovative information technology in health care practice. From the beginning we have put the course on a European level, because we are convinced that much common ground can be found despite local variations. Networking at a European level also provides the student with a unique learning experience and an international network that will last.

To our knowledge, there are no similar courses of this kind in Europe, or even in the world. Existing courses are focused at undergraduates or fresh graduates, or research graduates and offer mostly the broad theme of health informatics.

Embedding the course in a research environment allows for innovative insights to be shared among the students and the staff. As researchers we have been able to profit from the knowledge and experience of our students. Some students have already expressed their wish to pursue a doctorate in our institute and have shown to be prolific authors.

IMIA is setting up an accreditation system for health informatics courses (6). We support this initiative. We hope that IMIA will not only include pure health informatics courses, but also programs that address the close connection between information and technology, health care and its social environment.

We wish to acknowledge all the persons that have been involved in developing and delivering this master course. We would like to name specifically Vic Peel (formerly at the University of Manchester), Graham Wright (formerly at the University of Surrey, now CHIRAD), John Bryant (University of Surrey), Chris Atkinson (formerly University of Surrey, now Brunel University) and Mats Larson (Carelink).

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