Seven years experience in nursing informatics education: changes over the years


Key words: nursing informatics, education, modular courses.

Summary

The third article in a series, it addresses revisions throughout the seven years and presents a discussion of developments that emerge from changing circumstances including external influences and technical developments. It concludes with the implications for the future of the Internet. Nine references.

The first article described the structured approach to the development of courses about nursing informatics at the School of Nursing at Noordelijke Hogeschool Leeuwarden (Leeuwarden Polytechnic). The second part outlined four of these courses in more detail. This last part addresses revisions throughout the years, and presents a discussion of developments that emerge from changing circumstances.

Since the implementation of the modules about nursing informatics in the "leraren opleiding verpleegkunde" (LOV, or program for nurse teachers) many changes have occurred. This paper will focus on the main changes in the past years. First the changes to the LOV program will be described, and after this the bachelors programme and nurse scientists programme. Also, the technical and organisational changes will be addressed.

Nurse teacher program - Module 1

In the beginning, the first module about nursing informatics for nurse educators, proved to be too ambitious to achieve all goals for every student. However, almost all the students passed the test of skills after only five sessions of 50 minutes practice with the simulation care planning system. Nevertheless, four assignments for this single module laid a heavy burden on the students, because simultaneously two other modules were offered. Therefore, the assignments, site visit and the knowledge test were integrated into one new test, which currently is to write a paper about the development and use of nursing information systems with respect to problem areas and solutions. The skills test has basically remained the same.

In the academic year 1995-1996, a survey about computer experience showed that only one student out of 15 had never touched a computer. In seven years this has
changed dramatically, in 1991 we started with seven out of 61 with experience.¹ Currently, the focus is kept more to the core of nursing informatics content, and the required level can be achieved.

There are also new topics included in the course which are:

1. integrated electronic patient records,
2. information management and processing,
3. classification and terminology issues,
4. nursing minimum data sets,
5. innovation of care and use of technology to support this.

Because of the limited hours for the module, we had to skip other parts. However, this could partly be integrated into another module about the nursing process that also needed revision. Therefore, we spread the different subjects of nursing informatics over two new modules, of which in the first semester one module addresses the use of information systems in health care. A second module in a midterm semester addresses the issues related to the nursing process, classification and terminology, information processing and modelling, and decision support. Use of Internet and World Wide Web for seeking information will be added as soon as the classrooms are equipped with this, however, demonstrations are possible now.

Since the beginning in 1989, there have not been dramatic changes in the available nursing information systems in the Netherlands.² The initial simulation programs, although we have upgraded versions now, can still serve their purpose and were worth the investment. Future directions in this area would be to work with a real time professional hospital / nursing information system that has integrated patient records. However, achieving this will depend on financial and technical matters.

Module 2

The second LOV module about integrating computers in nursing education did not change over time, except for updates of the reader and software. This issue of developing computer learning packages for nursing is almost never addressed in the Netherlands, and many schools of nursing are only just beginning to think about the use of the available material. Further, it proved to be too optimistic to teach how to develop adequate learning materials for computer use in a few hours. So only very basic content in this subject is currently covered. In the area of nursing programs based on CD-i and CD-ROM technology, there are three initiatives available in our country, of which only one is on the market. High costs compared to the small population of the Netherlands is one possible reason, besides the lack of knowledge among nurse teachers about how to develop such programs.

Changes for the baccalaureate level module and nurse scientist course

The modules for the baccalaureate programme have changed dramatically due to a major change of the curriculum. We have now spread the nursing informatics content over the four years in the following way:

Basic computer skills in the first year. Use of hospital and nursing information systems for admission and care planning in the first and second year. Information management and processing, classification, terminology issues, nursing minimum
data sets, and use of information technology in innovation of care in the third year. The issue of decision support has not found another place, but should be incorporated again in the final year where quality of care and innovation are the key issues. This is still on the agenda, but has not been achieved yet. The use of automated care planning systems and terminology issues will be integrated in the basic module about the nursing process and problem solving, which will start in this academic year.

Because the nurse scientist programme at Groningen University is a satellite programme from Maastricht University, and in 1994 it was decided by faculty in Maastricht to skip all elective courses, the course on nursing informatics had to be dropped as well. Despite the need for proper education about information systems for nurse scientists, from that time on it is no longer offered in the Netherlands. Unfortunately, this is consistent with earlier remarks about lack of interest in the impact of information systems on nursing, and about the desperate need for health informatics education of health professionals. ³

**Technical and organisational matters**

With respect to technical development there has been a growth from one classroom with stand-alone XT machines, via three classrooms with AT machines networked to a minicomputer, to the current five classrooms equipped with 486's in a PC LAN. Use of external networks such as Internet has been possible for demonstration purposes only. The next effort will be to hook all classroom and teacher machines to the Internet, which will take place in 1996-1997, together with a change to Pentium machines with Windows 95.

In the area of software the following changes occurred. Besides the IPOZIS care planning program, the AGNIS program, developed by Derek Hoy and offered to ITIN readers a while ago, serves now as an example of a Windows based nursing care planning system. The number of computer assisted learning packages (CA-L) has increased, however, their use is not always effective. Most CAL is placed in the second module for the LOV to show the nurse teachers the differences in the types of CAL and in the way CAL can be implemented. In the baccalaureate programme we use several CAL programs dealing with patient cases, skills, patient rights, medication error prevention, basic statistics, scheduling, budgeting and workload measurement.

The plans to use literature search databases, although defined and approved in the policy and implementation plan, were never carried out, mainly because of the poor technical infrastructure of the school building at that moment. This has been a pity during the past years, but we now can offer the state of the art "On-line-contents", which covers about 14,000 journals from all over the world and offers us more than the other databases could have done. Also, the students of Leeuwarden Polytechnic can access university and scientific libraries from all over the Netherlands, books can be borrowed, and copies of articles ordered. In this case a little patience was worthwhile as we plan to tackle the cost of searches by changing, in the near future, from librarian based searches to self-directed searches by students.

A problem for the organisation has been the relative weakness of having only one person developing all the courses and integrating the CAL materials into other modules. Other colleagues were trained and involved in the developments, but only a few picked up the thread and continued the efforts. In the last academic year, lessons about nursing information systems were just not given, yet they are described in the
curriculum, the teachers know in principle how to use them, and the technical material is available. Someone forgot to include it in the module! Of course these are correctable problems, but it shows that quality and acceptance alone are not enough, several practicalities can stand in the way of nursing informatics education.

Discussion and conclusion

Over the three articles we have addressed the question of how to ensure that nurses, who will become teachers in nursing, will be properly prepared to teach the subject of nursing informatics in a way that meets the needs of the profession in the future. Further, the question was answered of how the learning materials for the LOV program could be used for other types of education. The efforts at Leeuwarden Polytechnic and Groningen University to build modules on this subject in a structured way have been discussed. Spin-off of this material to other schools of nursing proved to be feasible.

Courses have changed during the last seven years, but the most dramatic changes are more or less external to the nursing informatics content: curriculum changes caused the baccalaureate programme to spread the material of one course over several other modules. The rationale behind it is appropriate: teach students about computerised applications for a subject where the subject is taught. This allows for better understanding of the advantages computers have above manual or other devices. For the nurse scientist programme the change to drop the elective course is not appropriate. We think the nurse scientists are the leaders of the profession. All over the world prominent nurse researchers acknowledge the value of information technology for the further advancement of the profession, but the Netherlands seems to take the road back.

Major changes in the content of the courses concern the inclusion of such topics as nursing terminology, classification systems and nursing minimum data sets. Another area of change is that of the effects of systems on nursing care. Specific nursing information systems and CAL developments have not changed drastically in the Netherlands during the past years. From a nursing point of view, all available nursing specific software can be called "first generation" information systems and CAL. This is especially the case because all existing nursing information systems focus only on nursing, and do not address the need for integrated patient records very well. Changes in this area are underway. In the USA, the "Next Generation Nursing Information Systems" are under development. In the UK the focus is also changing to patient care systems. Systems that address nursing terminology and classification systems are available.

The topic of integrated electronic patient records that include nursing data for multiple use is another important change in the courses.

Another issue is that it is important to involve all teachers and to treat the development of NI courses as other automation projects from the beginning. Responsibilities concerning content and use in particular modules and lessons should be shared instead of left to one person. Of course, support of managers is necessary, which was the case for us. The other issue is to define small targets for every component to be successful and only move further with the next issue when most faculty members are familiar with the idea and make use of the first results.
Other areas not addressed in this article are the changes for nursing education to come. In the trend-report of the Dutch SURF organisation the question is raised of how long educational institutions can use the old-fashioned ways of teaching. (SURF is the Dutch National organisation for the network between universities, polytechnics and research institutions and their access to Internet). Internet and other distance education will probably cause major changes. Compared with this view on the future, the courses described here are still "traditional" in nature with respect to lectures, students coming to school, and use of content centred teaching methods. The challenge for Leeuwarden Polytechnic, and probably for all schools of nursing, will be to truly innovate the teaching into a learner directed and learner centred approach. Knowledge is changing dramatically fast, and finding and evaluating the right information at the right time at the right place will be more important in the future than it is now. Or as Perelman has put it: School is out and learning is in! How can we achieve such things for education in nursing informatics, which should be at the forefront to show how to use the new technology? Therefore, the access to "On-line contents" for searching available literature, and the planned access to Internet will be the most important achievements for future nursing informatics education at Leeuwarden Polytechnic. However, it can be expected to be only a first little step into the future of learning.

References


Glossary

AT, XT, 486 A particular type of processor that indicates the level and capacities of the computer.
CD-i Abb. Compact Disc - Interactive. A computer system that supports programs held on CD-ROM that allows the user to interact with the program and control the programme flow.
CD-ROM Abb. Compact Disc - Read Only Memory. A storage and access medium for large computer programs and data, based on the optical technology first used for audio compact discs. IMIA Abb. International Medical Informatics Association.
Knowledge elicitation - A research technique that solicits the knowledge of an expert, for example to ask an expert to think aloud when solving a complex problem.
Modelling decisions - To give knowledge or a decision to a specific structure so that it fits into a specific programme, and eases the use of knowledge or making a decision.
Module - A learning package that covers the learning goals, learning materials, assignments and tests.
PC-LAN - A network of several computer systems connected to each other in order to exchange data and share computer programs. Problem oriented teaching method - A method where students have a group discussion about a subject without having prior knowledge about it. They ask themselves questions about what they would need to understand and know of the subject, and then study the literature based on these questions. Their conclusions are presented to the whole group and discussed again. It proves to be more effective learning than traditional lectures.