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Information Literacy –Curriculum Integration with Medical School's Syllabus

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The information explosion is self-evident to anyone working in a library. All the same I would dare the statement that in the field of medicine the information explosion is a fact of daily life more pressing than in other fields. Far more than 2 million articles are published each year in about 21,000 biomedical journals, and the number of published articles is said to increase by 4% each year, not to mention innumerable medical books and other printed or electronic material.

Physicians are the only profession that is obliged by law to always stay up-to-date in their fields – anyway it's like this in Norway. That means working under cross-pressure from the profession itself, from the health authorities, from the well-informed patients, and in worst cases from lawyers. To survive both professionally, and not the least mentally, the physicians need knowledge, skills, tools and access to appropriate information. They need to be information literate. Years back people „Learned for life". It is not longer so. With research ever pressing forward it goes without saying that the knowledge-base once retrieved during eduation and studies is not sufficient to keep abreast with the information flow. The slogan „life-long-learning" reflects that learning is an active never-ending process.

The medical students are the researchers and clinicians of the future, and becoming information literate is of utmost importance. In our library medical students is a user group of high priority, and in the following I will present the information literacy programme developed for this group, and some future plans.

Two factors have played their parts in establishing an information literacy programme for medical students:

- The choice of PBL (problem based learning) as the pedagogical methodology of the study of medicine – a methodology which calls on the library as a very central and important cooperator.
- From the year of 2000 Library of medicine and health sciences has been organized with a separate Department of user education, with librarians dedicated to teaching.

The priority of user education is strongly underlined by this way of organizing the library. Three librarians are working in this department, which corresponds to 12% of the staff. Library of medicine and health sciences is the only university library in Norway organized this way with a separate Department of user education.

Library instruction has been scheduled since the pedagogical shift to PBL in the study of medicine in 1996. In Norway the study of medicine is a 6-year course. Library instruction is not compulsory, however, being on the time-schedule, approx. 90% of the students attend. That seems to be a good result as to numbers, however, when evalutating the teaching, by talking to, and observing the students behavior in the library, it is obvious that improvements can be done.

Library of medicine and health sciences runs a curriculum integrated information literacy programme during the 1st and 5th year of study. Up till now the library instruction has been scheduled as follows:

- *1st year:*
  Library orientation / guided tour (45 min.)
  Introduction to literature searching and source criticism (3.5 hours)
- *5th year:*
  Advanced clinical literature searching techniques/Evidence Based Medicine (3 hours)

The non-formal evaluation shows that the first library introduction is given too early when scheduled the first week of study. The new students are highly motivated for medicine and patient treatment, but the library does not get the same attention. When teaching the 5th year students in advanced clinical searching techniques, the students often comment: „why haven't we had this kind of teaching before?" Based on these experiences we have started a discussion with the Medical faculty on how to integrate library instruction within the medical syllabus at a more optimal time. This may be a long way to go, however the important thing is that the process is started. Timing is crucial –

the students must be motivated and feel the need for such knowledge, and the teaching methods must be varied and activating.

In order to find the most appropriate time for library instruction, I have been in contact with collegues at university libraries which have proven some kind of success as to curriculum integrated information literacy programmes for medical students. I have been eager to detect – if possible – any success factors to see what can be implemented with us.

I have visited Harvard Medical School in US, and University of Leicester UK, and several university libraries by web and e-mail. Based on discussions with collegues and their and our experiences as to information literacy programmes for medical students, we have come up to a proposal of a plan for an information literacy programme integrated throughout the entire 6-year course. The objective is to present a comprehensive curriculum integrated information literacy programme in cooperation with the Medical faculty. The medical students shall be trained in finding, evaluating and applying research information. The students shall gain knowledge and skills in literature searching, by formulating search strategies and construct targeted bibliographic searches. They should also get a toolkit of suitable programs as a ballast for life-long-learning, such as for instance bibliographic software.

INFORMATION LITERACY – NEW PLAN

INFORMATION LITERACY *Curriculum integrated information literacy programme*		
Library instruction	*Literature search*	*Source criticism*
5th year		**Evaluation**
non-electronic material; printed catalogues; index medicus; old collections	databases – secondary resources; Cochrane Library; other relevant databases; bibliographic software	ethics of citation; copyright rules; Vancouver style; peer-reviewing; impact factors
4th year		**Evaluation**
local holdings: Bibsys III; locating books and journals; document delivery	Medline II; MeSH; subheadings explode; MeSH vs. textword searching; focused search strategy related to writing of paper	critical appraisal technique, II; primary and secondary studies/ resources; What is a systematic review? meta-analyses
2nd year		**Evaluation**
local holdings: Bibsys II; combination of search terms (Boolean search); subject searching with MeSH; journal holdings print/electronic	Medline I; combination of search terms, Boolean AND OR; search strategy integrated in PBL-cases	critical appraisal technique, II; evidence-based medicine; the complexity of information
1st year		**Evaluation**
local holdings: Bibsys I; author and freetext searching; library orientation; lending rules; the library's home page	What is a database? What is a research article? content, form and structure of bibliographic references; local databases; Medline *Plus*; teaching tutorials on CD-ROM	Why source criticism? quality evaluation criteria; quality assessment of web pages; Internet search engines
Foundation – expected skills: *PC-skills, word processing, elementary web-surfing techniques*		

The information literacy programme can be broken down into modules like this illustration shows. At the bottom is the basis of expected previous knowledge like elementary PC- and surfing-skills. On this foundations three columns of knowledge raise: the column of library knowledge/instruction, the column of literature searching and the column of source criticism. Each column is divided into modules corresponding to year of study – the 1st, 2nd, 4th and 5th year, and every module builds on knowledge of previous ones.

Teaching literature searching skills and library orientation generally, most libraries do. Where the teaching in many medical libraries, including ours, differ the most from other libraries, is on subjects of the third column, the „source criticism". In cooperation with faculty staff we teach so-called Critical Appraisal Technique, which is about helping students to improve their ability to search for, and evaluate clinical evidence as a basis of deciding on patient treatment. Knowledge of research designs and statistics is incorporated into search strategies for refinement. Critical appraisal is an essential part of evidence-based health care.

Breaking the library teaching down into component parts like this have several advantages. First of all it gives a bird's-eye view and an overall understanding of what information literacy might be, and what kind of teaching the library can provide. Every module will have written objectives and learning outcomes. Students and teachers will see the connection and progression of knowledge, that the single library class is a part of a bigger plan, so to speak. Breaking the teaching down into modules makes it also easier to fit library classes into the students' time tables. Information competence is a never ending story. It's a competence to be developed together with the subject area studied.

Evaluation of Library Knowledge

In order to reach the overall goal „the information literate student and graduate", I think it's of utmost importance that these skills are tested. Incorporating library skills questions into exams when appropriate, will act as powerful signals that this is important knowledge. For instance, at the University of Leicester UK, the ability to perform a literature search in Medline is tested as a part of their practical clinical exam, where the students also demonstrate their ability to master medical procedures like injections, measuring blood pressure etc. Failing literature searching will ruin the practical clinical exam

just like failing in any other medical procedure will do. At the University of Oslo advanced clinical literature-searching is integrated in the 5th year exam. Information searching skills should be given as compulsory classes, so that graduates master the information tools that are the foundation of life-long-learning. The information literacy programmes should give credits and be a part of the examination structure at the universities. For instance at the University of Hawaii at Manoa, their semester-long information literacy course gives 3 credits.

Every library offers some kind of user education – the library is a pedagogical institution. If we look at our teaching in a critical way – how do we assess the impact of our teaching? Is teaching just something the librarian rattle off, or has it proven effect? Does teaching searching skills to students measurably improve the quality of their searches – and how long does the effect last? What is the most effective way of teaching literature searching skills to induce changing habits?[1] And likewise important: What kind of teaching has proven waste of time? Certainly, there might be more questions than aswers.

Library of medicine and health sciences contributes to data collection to a doctoral degree, so in a few years time the effect of the library's teaching can be measured scientifically. Over a period of 3 terms the 5th year students are randomised into two groups. One group is teached advanced clinical literature searching by librarians, the controls do a self-study on CD-ROM. The results will be very interesting.

I have read articles where libraries present their teaching programmes. What would be more informative is literature reviews of these articles, and especially systematic reviews of the literature, which summarize the knowledge and present the critical success factors as to library teaching.

To sum up I will list the success factors I have come across so far:

- Prove ability and willingness to teach
- Find some „champions" at the faculty who will advocate the library
- Curriculum integration
- Offer units to fit in time-tables
- Timing is crucial – cooperate with faculty:
- Projects? Papers to be written?

- „Licenced to skill"
- Evaluation/exam with credit

These days when distance learning is an opportunity of choice for students, they are not as before, bound to the local, or even national universities. Under these circumstances we will work hard to keep and develop our library so that we not only fulfil our users information needs, but also strive to be in the forefront in the area. I find a statement in a paper from Bracken Health Sciences Library at Queen's University, Kingston Canada, to be quite a highlight when they conclude that „… educators in other medical teaching centers have noticed that our medical students and graduates are *noticeably* more information literate than those from other institutions"[2]. Our goal is that this should be said about our library as well.

REFERENCES

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2 Queens university. The evolution of curriculum integrated information literacy in the health sciences at Queen's University. <http://library.queensu.ca/webmed/evolution.htm> (15.01.02).