THE DEVELOPMENT OF END-USER EDUCATION IN COMPUTERIZED INFORMATION RETRIEVAL IN THE NORDIC COUNTRIES

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1. Introduction

This article will be directed towards the development of teaching/learning about computerized information retrieval for Nordic end-users during the period 1970 to 1985, and the role that NORDINFO played in relation to this. Online searching was introduced in the Nordic countries in the early 1970s, following the earlier batch processing systems. I still remember the delight of research workers and engineers when they first were able to search from a terminal directly connected to a remote computer (in Stockholm) for information related to their research topics! Often the connections broke down, and we had to negotiate with the Royal Institute of Technology for an extra hour of access, but for the user, who had previously had to search manually through years of abstract and/or index publications, or wait for weeks for the computer print-out of a batch search, online searching was often described as a miracle! We who were lucky enough to be involved as teachers experienced a real joy in seeing our research colleagues delight in this new way of information searching. Several groups were involved in providing some form of online education: database producers, systems operators, institutions with equipment for online searching - such as libraries and companies - library schools, intermediaries and end-users.

In connection with computerized information retrieval, three different kinds of teaching/learning activities can be distinguished:
- Promotion concerned with increasing the use (and sales) of a specific database, a given online operating system or a specific Information retrieval facility.
- Training concerned with the learning relatively simple skills such as use of a terminal or a given command language - how to use a given service.
- Education concerned with concept formulation, analysis and synthesis, as for example in search question negotiation, search strategies, and the comparison and evaluation of alternative Information retrieval systems, see Fjällbrant, 1980.1

There are a number of target groups for these teaching/learning activities: end-users of information (including students, research workers and practicing professionals), and intermediaries – library staff, information specialists, etc. Training seminars for the information specialists were often provided by the database producers and/or system operators. In some cases these seminars could also be attended by end-users such as postgraduates or practicing engineers. This article will be directed mainly towards the development of teaching/learning about computerized information retrieval for Nordic end-users during the period 1970 to 1985.

2. The introduction of computerized information retrieval - Selective Dissemination of Information

The enormous growth of published information in the 1960s resulted in long time delays between the primary publications and secondary publications such as abstract publications and indexes. In order to speed up the production of the secondary publications, computers began to be used in the printing process. The bibliographic records, keywords and sometimes any available abstract were stored on magnetic tapes. This stored information could then be used by a computer for printing the abstract and index publications. Most often the stored information was also made searchable. The early retrieval methods were based on batch processing. A search question was formulated and analysed into component aspects, which were then represented by keywords or descriptors. A search statement was developed and expanded by means of synonyms, broader and related
terms and the statement was then keyed into punch cards and batch processed. The results were then posted to the person who had requested the search. This process of Computerized information retrieval (or Selective Dissemination of Information (SDI) when the search was only done in new information to be added to the system) was to lead to enormous changes in the work at libraries and documentation centres – a change foreseen as an exciting challenge by Björn Tell, Library Director at the Royal Institute of Technology, Stockholm, in the early 1960s, Olsson (1995), 2 and Tell (1966). 3

This process of Computerized information retrieval was initially based on a small number of systems, such as the MEDLARS system for the production of Index Medicus. MEDLARS was first used at the National Library of Medicine (NLM) in 1964. Professor Sune Bergström introduced the MEDLARS and founded the Biomedical Documentation Centre (BMDC, now the Medical Information Center, MIC) at Karolinska Institute in Stockholm in 1966, and this system was in regular use from 1967 onwards. 2 In the same year the Nordic Culture Foundation awarded a grant of 200,000 D.Kr. in order to facilitate the start of computerized information retrieval activities in Denmark, Finland and Norway, see Olivecrona, (1970).4 Similarly SDI systems in chemistry and chemical technology such as Chemical Titles (CT), Chemical Biological Activities (CBAC) and Chemical Abstracts Condensates (CAC) had been introduced at the Biomedical Documentation Centre at Karolinska and other Nordic institutions such as The National Technological Library of Denmark in cooperation with Danish Datacentralen, see Kallner (1970)5, de Heer (1969)6 and Skov7 (1968)

At the Royal Institute of Technology in Stockholm, the Information and Documentation Centre (IDC) was officially founded in 1968, although databases were already being used in 1967. IDC provided SDI services within the fields of science and engineering, Olsson (1995).2 Advanced search programs for SDI were developed at the Royal Institute of Technology Library, see Tell, Larsson and Lindh (1968)8 and Tell and Lindqvist (1971).9 By 1969, the SDI- system covered 12 databases: Science Citation Index, Mech-Eng KTH, POST – Polymer Science and Technology, Chemical Abstracts Condensates, INSPEC, Metal Abstracts, COMPENDEX, Nuclear Science Abstracts, ABIPC – Annual Bulletin of Paper Chemistry, Food Science and Technology Abstracts, ERIC, and Current Index to Conference Papers. The first links to a remote terminal online system were ESA-RECON with direct access to the European Space Research Organisation (ESRO) in Darmstadt (IDC 1973, DTB 1974), and MEDLINE (MEDLARS online, 1972) at BMDC in Stockholm. In Finland the Medical Central Library got an online connection to BMDC as early as December 1972 and online access to the American services Lockheed and SDC started in 1974. By the beginning of the 1970s several databases could be reached through a number of remote terminal systems, and the online age had begun.

3. Early days - user instruction in computerized information retrieval in the 1970s

The first record of a course designed for users that I have been able to find information about is a course in information and documentation techniques given at the Royal Institute of Technology, Stockholm, in 1968, see Gluchowicz, 1968.10 This paper states that a two months course ended on 31st May 1968. The course attempted to cover the whole process of information storage and transmission. The section about computerized documentation was “much appreciated.” There were 18 participants in this course, many with a Master of Engineering degree, or a degree in the physical or natural sciences. In a course evaluation “most participants suggested that this type of course should be a compulsory subject in every academic degree.”

Instruction about the new, and exciting, possibility of retrieving relevant information in the form of a computer print-out, was given in the form of seminars of varying length for researchers, university lecturers, and for practicing doctors and engineers. These seminars were held by the staff at university libraries, documentation centres and other places where the new techniques were used.

During the 1970s there was a growing interest in library user education in Denmark, Finland, Norway and Sweden. This was demonstrated in a number of ways: by surveys, articles, and meetings about user education, by the introduction of the subject into the curricula of library schools, and most of all by the growing number of courses at individual libraries. The focus tended however to be towards library orientation, and the use of manual tools for finding information, rather than computerized information retrieval. The higher education libraries that were most active in teaching about computerized information retrieval during the seventies were those within the disciplines of medicine, science and technology. This is hardly surprising for many of the early databases covered subject areas relevant to these disciplines.
3.1 Denmark

The Library of the Technical University of Denmark at Lyngby (National Technological Library, DTB) was particularly active in promoting user education for engineering students and for practicing engineers from industrial concerns. These courses were arranged in modules, so that students could select and combine different units to suit their own particular needs. From 1976/77 onwards these courses were available for all the engineering departments of the university. The Documentation Department at DTB arranged the courses for retrospective online literature searching. The ESA-RECON system was introduced to users in 1975 and this was followed by courses on the Lockheed (now Dialog) and SDC (later Orbit, now Questel-Orbit) Systems. The length of the courses varied from half a day to two days. Participants in the retrospective online literature searching courses were lecturers and researchers from the university and the Engineering Academy and scientists and engineers working in research institutions and industrial concerns. A special Chemical Abstracts Workshop dealing “with the newest search techniques in the CAS system” was also arranged by the Documentation Department. This attracted about 100 participants from the Scandinavian countries (Jørgensen, 1977).11

The Documentation Department of the National Technological Library became the Danish center for the ESA-RECON system in 1974, with the responsibility for training. Betty Vedel describes these early days: “In the first years we had mostly demonstrations. We made, however, the discovery that people want to try for themselves and changed the demonstrations to online courses and developed a 3 hour course…. It is my sincere belief that this online technique is so strange and unbelievable that unless you try it for yourself, you will not understand it well enough and will not gain confidence in the idea of computerized information retrieval. For me as a teacher, I still share the amazement and joy of the beginner when he/she tries the system, sees it working and all of a sudden relevant references come pouring out. Usually I hear the words – It's a fantastic system!” Vedel (1982) 12

An important part of the work in an educational programme is the production of suitable textbooks. It is interesting to note that the textbook - Informationssøgning for ingeniører (Information retrieval for engineers) - was published by the National Technological Library of Denmark (DTB), in 1972. This book was directed toward students, but could also be used by practicing engineers who wished to keep up-to-date with the new possibilities for information searching.

In the biomedical area end-user presentations were given on request by staff at the University Library, Medical and Scientific Department (UB2), in Copenhagen on how to search the MEDLINE and BIOSIS databases. UB2 had made agreements to use the SDI service and databases in medicine and other biomedical, chemical and psychological databases at BMDC. The University library in Odense (OUB) was the first place in Denmark to formalize education for medical students in library use and literature searching. This was organized by Johan Wallin from OUB, who from 1978 included Medline and online retrieval in the course.

3.2 Finland

In 1967, TINFO - the Finnish Council for Scientific and Technical Information – appointed a committee to study the organisation of user instruction for the effective use of information sources and services. In 1969 a questionnaire on user instruction was sent out to 24 academic libraries. As a result a recommendation was made in 1970 that all students should receive training in the use of information sources and that this instruction should take place in the academic libraries under the guidance of librarians or information officers. Instruction should include the use of information sources and information services. Students, research workers and academic staff should be taught the use of computer-based information retrieval. The Committee recommended the provision of special funds for these purposes, but in actual practice user education in the Finnish academic libraries was largely financed by funds from their respective universities.

These recommendations acted as a stimulus for the development of user education in the Finnish academic libraries. Uutto stated in 1977 “Instruction in the use of libraries and in information retrieval is making rapid progress in the research libraries in Finland” (Uutto, 1977).13 At the Helsinki University of Technology Library, user studies carried out by Erkko in 197014 and Törnudd in 197315 clearly showed the need for user instruction. Instruction in the use of information media and information services formed regular parts of various teaching programmes at Helsinki University, and at the universities of Turku, Oulu, Jyväskylä, Kuopio and Joensuu, as well as the Tampere and Helsinki Universities of Technology. Uutto (1977)16 describes the courses at Helsinki University of Technology in some detail. The elective subject-oriented courses for third and fourth year students contained units on both manual and computer-based information services. Video-taped programs were produced as aids to
the instruction. In 1973 the HTKK-INIS (INIS is an abbreviation for International Nuclear Information System) search system was introduced at the Helsinki University of Technology, see Schröder (1978). The first online training given was subject-oriented instruction with a one hour lecture and demonstration followed by hands-on practice. The online system was made available via SCANNET to the Nordic INIS centres: Riso Library, Denmark, the Institute of Atomic Energy, Norway and Studsvik Library, Sweden. In 1974, Lockheed and SDC demonstrations were given to Finnish users at the Training Centre for Engineering Societies.

MEDLINE was introduced in January 1973 in Helsinki with a stand at “Lääkäripaivat” – the main postgraduate meeting for physicians. Gunvor Svartz-Malmberg from MIC came to help with the online demonstrations. MEDLINE became operational in the spring of 1973 and there was a great need to inform “the actual and potential users of the library about the new rapid access to the most recent medical literature. The system aroused such a great interest among medical practitioners, researchers and students that demonstrations were requested to be arranged one after another”, see Öberg (1977). At the Central Medical Library – CMK – Helsinki, programmes on the MEDLINE computer-based information retrieval service were produced as an aid to user training. Due to the limited operational access time at the terminal and to its unreliability, and as a means of saving time for the information scientists, it was decided to produce a MEDLINE videotape with the help of the Educational TV-Unit at the Medical Faculty. This took a period of three months, but proved to be successful and time saving.

The Central Medical Library provided user education for medical and dental students from Helsinki University. The aim of the course was to teach the students how to use the medical library, the most important reference works and databases. The students had exercises using printed Index Medicus etc. and online searches were demonstrated, see Suutarinen, 1983 and 1985. User education was given to researchers and medical practitioners, as part of a course on Research skills. This included a lecture about databases, information retrieval and demonstrations of online searching. With the advent of the Finnish medical database MEDIC, courses were given on its use. Figures about the hours of user education show a rise from about 30 hours in 1975 to 90 hours, in 1980, a level that was maintained until the mid 1980s.

3.3 Norway

In Norway the computerized information searching era began with the introduction of SDI services from RITL and BMDC in early 1970s. The Norwegian Institute of Technology Library (Norges Tekniske Høgskole, Biblioteket, NTHB) made in 1971 agreements to use the SDI services and databases in science and engineering at RITL as well as the MEDLARS and other biomedical, chemical and psychological databases at BMDC for Norwegian users. Therefore, from late 1971 onwards NTHB gave promotion and training of these database services to the university, and as the national technological library also to institutions and industries (Hegseth). From 1972 information about and practice in using these database services were incorporated in the voluntary library courses offered to the engineering students at NTH 4 times a year (each course 12 hours). The Norwegian Centre for Informatics (Norsk Senter for Informatikk, NSI) gave from early in the 1970s training in POLYDOC, a system which later became available with several Nordic databases in SCANNET (Schanche). The library of the Agricultural University of Norway (Norges Landbrukshøgskole, NLH) started in 1972 an SDI-service in the agricultural field with tapes from Bibliography of Agriculture, USA, and offered promotion and training of their service (Myckland). The first information week, Informatica, was arranged in Oslo, Bergen and Trondheim in 1972, with lectures and presentations of computerized information systems of that time (Rugaas). The Division of Biomedical Documentation of the Norwegian Research Council for Science and the Humanities (Norges Almenvitenskapelige Forskningsråd, NAVF, Avdeling for biomedisinsk dokumentasjon) offered training courses in biomedical documentation from 1972. From 1973 this division operated the first experimental MEDLINE search service. The same year NTHB started with MEDLINE searching and included this online search service in their promotion and training in database searching. In 1974, Oslo University Library took over responsibility of the MEDLINE service at NAVF, and MEDLINE terminals also became operative in the other Norwegian university libraries, see Lamvik, 1982. All connections from the universities went to the Swedish MEDLINE node. All university libraries gave training and promotion of the MEDLINE database to their users.

At the University of Oslo, the user education courses were given for medical and dental postgraduates. These included the use of bibliographies, manuscript writing and orientation in computer-based literature searching, see Haaland, 1977. From 1975 onwards, at the Biomedical Library, online demonstrations were given, but the connections to Stockholm and/or to USA were very unreliable, so we had to sometimes resort to overhead transparencies, Halldal. Kari Halldal gave courses for librarians about MEDLINE searching, and sometimes,
medical researchers brought colleagues or students to the library for a presentation, followed by demonstration – if the connections functioned. A similar course on information searching was offered for advanced students and young researchers at the University of Bergen, by the Medical Library.

The Norwegian Institute of Technology Library had a well-developed programme of user education in the 1970s, see Gjersvik, (1972).28 Twelve-hour courses were offered regularly to the advanced students. These courses came to include computerized information retrieval. Case studies were often given as examples. Early in the 1970s, “Information Searching Days” were introduced every second year for industrial users, and in 1977 the first of a series of “Online Searching Days” was given for the same clientele, see Lamvik (1982).25

The first ESA-RECON connections for Norway were through Denmark. Norway became a full ESA member in 1987, and in 1988 NTHB became the national ESA-IRS center. Until then Norwegians got passwords and contracts from DTB in Denmark. NTHB, and also NSI, started to offer training courses in ESA-IRS to Norwegian users from 1976. Lockheed/Dialog and SDC/Orbit training seminars were also given in Norway from 1976, and database producers and hosts gave training seminars in the country, as they did in the other Nordic countries.

3.4 Sweden

Library user education in Sweden began in the mid 1960s, and the leading libraries in this field were those serving specialised universities, such as Institutes of Technology, the University of Agriculture and the Karolinska Institute of Medicine, see Sanner, (1977).29 A number of the new multi-faculty universities – at Umeå, Linköping and Stockholm – and the university colleges at Luleå, Örebro and Växjö – have also launched successful library user education programmes, see Sanner, (1977).29 The programmes offered can be divided into three basic levels:

- Orientation to the use of the library
- Introduction to information retrieval – for students who are working on projects or essays. This was often provided for students who were in their sixth to eighth term of study
- Advanced information retrieval – for postgraduates. These courses usually included the use of appropriate bibliographical tools, and, where appropriate, the use of computerized documentation, and sometimes the organisation of a personal documentation system, and how to write a scientific paper.

This was also the model followed at Linköping University Library when user education was first introduced in 1973, see Lindberg, (1979).30 At the Karolinska Institute of Medicine and Surgery, postgraduate courses were started at the beginning of the 1970s, with one course each term, see Ljungars, (1974).31 This included computerized information retrieval, the organisation of a personal documentation system, the layout of a scientific paper, presentation of diagrams and figures, printing and production of figures, see Nordenskiold, (1978).32 Courses for medical students were also given at the Biomedical Library of Gothenburg University.

At the Royal Institute of Technology, Stockholm, user education courses started during the late 1960s and were continuously developed through the 1970s, see Gluchowicz, 196810 and Sabsay, 1978.33 At the Royal Institute of Technology Library (RITL) “only the School of Mining and Metallurgy, the School of Aeronautics and to some extent the School of Chemistry had formal courses in library use before 1973”, see Sabsay.33 In 1974 a start was made to create a more comprehensive and flexible programme, see Gluchowicz, 1974.34 This led to the development of a number of courses for the various Schools of Engineering. One example was a 17-hour course for students of Mechanical Engineering. This included both online demonstrations and the creation of individual SDI profiles. This course was carefully evaluated, see Sabsay, (1977)35 and Klasén and Sabsay, (1979).36 The evaluation shows that those attending the course changed their information habits permanently by using more information sources and that by actually working with computerized information systems they got a better understanding of how to solve their information problems. In connection with the various educational activities at RITL, teaching material of various kinds was produced. These included the course compendium “Informationssökning för tekniker och naturvetare” by Lars Klaséen and Peter Sabsay.37 (Trita-LIB: 5008) The first edition was published in 1978. Other material included database descriptions, overhead slides and a sequence on online information for an educational television programme on Modern data-technology in 1975. Computerized information retrieval formed part of other courses at the Royal Institute of Technology and in fact most of the students through these courses tried to set up SDI search profiles running for about three months.

The most comprehensive programme of user education in Sweden was to be seen at Chalmers University of Technology in Gothenburg. This four part programme was developed during the years 1973-1977 and consisted of:

- Library orientation for approximately 900 new users per year (2 hours)
- Introductory course in information retrieval for approximately 800 undergraduates per year (14 hours)
- Advanced courses in information retrieval for postgraduates, 2-3 courses per year (35 hours)
- Seminars on information retrieval for industrial engineers, given on request – 2 to 3 courses per year, half to two-days as required.

One particularly interesting feature of the Chalmers University courses was that the majority of the courses were compulsory and integrated into the projects or thesis work of the participants. During the seventies, computerized information retrieval formed part of the Advanced postgraduate course. “Each user carries out interactive literature searches on one or more of the following systems: LOCKHEED-DIALOG, ESA RECON or SDC/ORBIT – three information systems containing many data bases in science, technology, engineering, social sciences, economics and business. These systems can be accessed interactively for either retrospective or current awareness searches.” see Fjällbrant & Stevenson, (1978)38 and Fjällbrant (1976).39

Fig.2 . Postgraduates carrying out an online search on a Decwriter

A short presentation on computerized information retrieval formed part of all the undergraduate courses from 1977 onwards. The course compendium Datorbaserade informationssökning by Nancy Fjällbrant was first published in 1974, and followed by subsequent editions. From 1978 onwards an introduction to online information retrieval was given in form of multi-media programs. These were produced at Chalmers university as an inexpensive method for user-education in online information retrieval. They made use of the MEDIATRON teaching aid – a modified tape recorder designed to carry out simultaneous recording of audio commentaries, trigger pulses for photographic slides and digital signals from a computerized information retrieval system – developed at London University by Pratt and Vickery, 1977.40 Examples of orientation programmes featured searches on: The use of wind energy for heating, The presence of DDT in seals in the Baltic, Home-care for geriatric patients, see Fjällbrant and Hård.41 These programmes were very useful, in that they could be used when the host computer or node or telecommunications system was “down” – a not infrequent occurrence in the early days of online searching.

Fig. 3. Two views of the MEDIATRON equipment
The University of Luleå, the newest and most northerly of Sweden's five technological universities, was opened in 1971. Library user education was integrated into project work, and a three stage programme developed. In the advanced course and later in the postgraduate course, students were introduced to computerized information retrieval, see Marklund, (1977). 42

A course in “Information and documentation techniques” was held in Lund in 1971/72 for engineers and other graduates who were out of work. The comprehensive course lasted for 22 weeks and included “Computerized Literature Searching and SDI” This part of the course, given at the Royal Institute of Technology in Stockholm, included practical training in the use of SDI systems, see Wormell, (1972). 43

4. NORDINFO and user education during the 1970s and early 1980s

NORDINFO - The Nordic Council for Scientific Information and Research Libraries - was established in 1976, as an intergovernmental agency for cooperation in the information and library field in the Nordic countries (Denmark, Finland, Iceland, Norway and Sweden). “The main purpose of NORDINFO is to promote Nordic cooperation within the field of scientific information and documentation, principally in connection with the research library system. NORDINFO shall also promote Nordic interests in a wider international context. NORDINFO's task is to be instrumental in development, aiming at better and more efficient ways of disseminating information to research workers and other users of scientific and technical information resources in the Nordic countries.” NORDINFO's programme for the years 1978 to 1982 covered four main areas: 44

· Policy development including coordination and development activities
· Basic provision of information
· Databases and networks
· Education

This programme resulted in a number of projects, which were directly relevant to the development of educational activities related to computerized information retrieval. Examples of early work are training courses in 1977-78 in the use of databases in crystallography and mass spectrometry, developed by Medicindata, Gothenburg; support during 1977 for training seminars: ESA-RECON in Finland, BIOSIS in Denmark and AGRIS in Norway; and the development of a mini manual for the users of the INIS database.46 Training seminars for the users of the INIS system were supported by NORDINFO funding, and held in Denmark - Roskilde, in Finland - Esbo and Åbo, and in Sweden - Stockholm.47 NORDINFO also provided support for the education of users in information retrieval from the SCNP database developed by the Nordic Schools of Economics.48, 49

In a report on library education in the Nordic countries, Ben Rugaas, took up the issue of user education – “Det har blitt pekt på en gledelig utvikling innen bibliotekutdanning er tendensen til nå å sette brukerne i fokus. Og brukeraopplæring generelt kan styrkes ved bl.a. bedre opplæring i emnet ved bibliotekskolen og andre institusjoner.” ("It has been pointed out that a happy development within library education is the tendency now to focus on the users. And user education in general can be strengthened by, among other things, better training in the subject at the library school and other institutions"). He also mentioned the need for a Nordic clearinghouse for instructional material, see Rugaas, 1978.50 Ralph Strömfelt wrote a report on user education, stating that this was established to a greater or lesser extent in the academic institutions, but relatively seldom seen in industrial companies. He pointed out that there was a considerable need for the provision of training for a variety of target groups, and suggested possible actions, see Strömfelt, 1978.51 This was followed by another report on user education by Saima Wiklund, see Wiklund, 1979.52 These reports formed the background for NORDINFO's activities in the user education sector. In June 1979, NORDINFO decided to support the formation of a Reference Group for User Education. This group met in January 1980 and recommended that an inventory of existing Nordic material for user education should be carried out and that a Seminar for Training the Trainers should be held.53 The seminar for instructors, which was held in Borås in October 1980, was attended by some 30 participants. 54

Another suggestion from the Reference Group for User Education was that there was a need to produce an instruction package about how to plan and give user training. This important need – particularly marked in a new area of education - the development of teaching material was recognized by NORDINFO at an early stage. This led to support for the writing and production of textbooks and compendia. Examples of this are the funding of a textbook about interactive searching in databases, to be written by staff at the Royal Institute of Technology, Stockholm in 1978. This resulted in the book by Ulla Karlsson and Marie Wallin - Att söka i databaser: interaktiv informationssökning: metoder och möjligheter (Database searching: Interactive information retrieval methods and opportunities). - published as Nordinfo-publikation 8 in 1985.55,56,57
Reference Group for User Education resulted as a NORDINFO-publication Brukeropplæring – idéer og utkast til brukeropplæringsprogram (User education – ideas and an outline plan for a user education programme), which was published in 1983, see Alnæs & Brønlund. This publication contained an appendix on microfiche with an inventory of user education material produced in the Nordic countries. This had been compiled by Annika Lindberg from Linköping University Library. The publication was mainly directed towards librarians and information specialists working in small libraries and information centres in the private sector. This provided a valuable complement to the material produced by many of the universities for their user education courses.

5. Online education in the 1980s

The 1980s saw the development of DIANE Centres in the Nordic countries. The first to open was the Danish DIANE Centre, on April 1st 1981. The main aim of the centres was to support and promote the use of online systems in EURONET DIANE and elsewhere and help the online users to use the databases with maximum efficiency. One of the tasks for the DIANE CENTRES was the responsibility for user education at all levels and for different types of users. In Denmark this was carried out both in the Danish DIANE Centre which was placed at the National Technological University in Lyngby, and in other places throughout the country, see Vedel, 1981. Similar DIANE Centres were established in Sweden in 1982 and later in Norway and Finland (see chapter xx). These DIANE Centres were involved in online advisory and training activities linked to the promotion of European and to a certain extent other online services, in some cases by developing their own training courses in online information retrieval.

The online training activities were to a large extent based on hands-on exercises. For that purpose most online services contributed by giving the DIANE Centres either a restricted or totally free access to their databases.

During the 1980s an increasing number of universities and colleges were offering some form of orientation, training and education in information handling. In a Nordic survey carried out by Fjällbrant in 1981, nearly all of the academic libraries had some form of orientation for new users, at least half had courses in user education for undergraduates, and an increasing number had courses which included online information retrieval.

5.1 Denmark

Throughout the 1980s, the National Technological Library of Denmark provided a variety of online information retrieval courses, see Vedel, 1982. 12

- Beginners open to everybody 3 hours
- Advanced courses for users with 6 months of online use 1-2 days
- Students from University of Technology 1-2 days
- Students other institutions (beginner’s course) 3 hours
- Demonstrations ½ - 1 hour

In addition courses by database producers were hosted for either database producers or systems operators. Sometimes these were free, sometimes a charge was made.

With the founding of the DIANE Centre in 1981, a large part of this user education was taken over and extended to include a variety of groups throughout the country. The Centre centralized the registration for online courses in Denmark, most of which were arranged at the Centre's own premises, which was equipped with “4 terminals and 4 monitors, overhead- and slide projector and a blackboard.” In the first 18 months 18 courses were offered, most of which were training offered by hosts and database producers. These were available to everybody and were available to both information specialists and end users. During the first five years several different host independent training courses were developed and given by the staff at the center. These were:

- Basic training 1 day
- Brief introductions ½ day
- Equipment for searching ½ day
- Microcomputers ½ day
- Criteria for choosing equipment ½ day
- Common Command Language 1 day
- Advanced search strategy 1 day

In addition lectures about information retrieval and the work of the center, had been given to a wide range of groups, such as students, journalists and bank employees (from the First annual report of the Dansk Diane
During 1984 the DDC provided 35 courses of their own with 637 attendees in total, and arranged 36 workshops and seminars with database providers and online services for 379 people, and all the services were free! In 1983 and 1984 an open seminar was held on Information and Documentation in the Humanities respectively Social Science. The last one attracted 160 people and was later repeated. In cooperation with the PPT a meeting on the new packet switching network in Denmark, Datapak, was arranged in 1984. Again 160 people attended.

The Danish DIANE center also produced and circulated a newsletter – DISPLAY – and an irregular series “Vink om... or Meddelelse fra Dansk Diane Centre” with advice about different aspects of online retrieval. A directory of courses was published 4 times a year with details of all online workshops and seminars in Denmark, see Retlev and Johne, 1982.

In Copenhagen, at the University Library, Medical and Scientific Department (UB2), introductory courses to MEDLINE, BIOSIS and EPOS/VIRA were given on request, during the late 1970s and early 1980s. These courses consisted of a three-hour presentation on how to use the databases, the indexing used, and the services provided by UB2. The Tandlægehojskolen (for dental education) had regular courses twice a year. In addition there was a course for biologist students on information retrieval which included a brief presentation about BIOSIS, see Retlev.

In 1984 the Library started to provide formal training in MEDLINE, both to information specialists and end-users. The end-user training were 2-days sessions with half a day used to online exercises of own choice.

The Royal Library introduced courses in how to search for literature in psychology for advanced students and at the University Library in Odense the medical training included hands-on exercises using CD-ROMs.

In 1985, Cotta-Schønberg reported, that in a period of economic retrenchment, libraries with decreasing resources had in a number of cases made reductions in user education programmes. Nevertheless there had been a number of interesting developments, such as the development of project oriented courses involving the use of computerized information retrieval at Aalborg University Centre, and annual courses in Research Methodology for medical postgraduates at Aarhus University. The latter included online information retrieval, where each user prepared and carried out a search and the use of microcomputers for processing references.

5.2 Finland

Growth in computerized information retrieval was particularly marked in Finland. In 1981 “nearly half of the university or college libraries gave some form of instruction in computerized information retrieval.” Haarala stated that, by the beginning of the eighties, education about computerized information retrieval, which had previously been given mainly to postgraduates, also became a regular part of subject-oriented instruction for undergraduates, see Haarala, 1982. This online education often took the form of lectures for two hours, followed by an online demonstration. For example, the Helsinki School of economics gave a half-day course, and hands-on training was available later at the Computer Centre. At the Helsinki University of Technology online searching was a possibility for students. “In many cases online education is compulsory because the new degree requirement regulations at Finnish universities include information studies as a compulsory subject in the curricula.” The postgraduate course - Information Systems and Services - at Helsinki University of Technology integrated online education into the curriculum, so that it was available at intervals throughout a whole year. During this course students constructed an experimental database – indexing and inputting items. The database was then used for searching. Both the Finnish School of Librarianship at Tampere and the Swedish School of Librarianship in Åbo included training in online information retrieval in their curriculum. Libraries and information centres experienced in online techniques, such as the Central Medical Library, Helsinki School of Economics and the Helsinki University of Technology, gave training for to library and information specialists on a consultancy basis. External users sometimes were included in these courses.

The learned and professional societies in Finland were also involved in online user education. For example, the Finnish Association of Chemistry gave a two-day seminar on chemical information with a strong online emphasis, and the Training Centre of the Engineering Societies gave a seminar for mechanical engineers, which included an afternoon session on online training. The Finnish online user group published the newsletter Online Uutisia.

In 1985, Haarala reported that there had been a steady increase in user education throughout the 1980s. In 1984, more than 18,000 students took part in user education programmes in Finland. An important recent trend was the
establishment of compulsory courses and the recognition that information retrieval methodology was a necessary tool for academic studies, see Haarala, 1985. 65

Training courses for intermediaries, information specialists, started in 1975 by Sauli Laitinen at VTT Information Service by inviting Lockheed and other database producers and hosts to give online training courses. At that time the online information searching knowledge was directed mainly to information specialists. The new possibilities of searching information directly online and not by reading abstract and index journals were quite a new opportunity and seemed somewhat unreal. Anyhow this development started in Finland as early as in 1975. The hosts invited in 1970’ies and early 1980’ies include Lockheed, SDC, BLAISE, BRS, Pergamon Infoline, Télésystèmes-Questel, NIH/EPA CIS, FIZ Karlsruhe, ESA Quest, DIMDI, FIZ Technik and DataArkiv. The following hosts and database producers also gave training at VTT: ABI Inform, Derwent, BIOSIS, Predicasts, CAS, INSPEC, CAB, IRB, Compendex, RAPRA, Beilstein. Various online courses were held at VTT as well as at the library of the Helsinki University of Technology and other university libraries especially focused on intermediaries but also on “end-users” as students.

5.3 Iceland

Iceland is by the far the smallest of the Nordic countries, and as such has had to struggle with smaller resources for libraries. Indridadóttir pointed out that many institutions had appointed their first professional librarian in the last 10 years, see Indridadóttir, 1985. 66 User education had been started with both orientation and subject-oriented courses on computerized information retrieval, and the latter included lectures on computerized information retrieval. “The University of Iceland Library was the only library that had appointed a full-time librarian (in 1978) to provide user education and an information service.” User education was divided into two parts: an introductory tour and advanced instruction linked to compulsory courses in several subjects. This included the use of appropriate databases. In 1985 about 200-300 students took part in this instruction. Work was also in progress on the production of three television programmes for broadcasting via the general television network. Jon Erlendssen described plans for the introduction of education in information retrieval into the Icelandic school system, see Erlelandsson, 1985.67

5.4 Norway

The Norwegian Institute of Technology played an active part in the introduction of computerized information retrieval services to library users within the university and to external clients, during the early 1980s, see Lamvik, 1982.25 This work was extended with the establishment of the DIANE Centre in 1986 (see below). Lamvik pointed out that, in 1982, there were not very many online searchers in Norway, with 53 Norwegian passwords to SCANNET and 46 to TYMNET (Amsterdam node). This picture changed over the next five years as the number of searchers increased. The Norwegian Centre for Informatics (NSI) A/S in Oslo also provided courses for librarians and industrial users on how to use the Polydoc and Micro Polydoc databases produced by the company.

In 1985, Torild Alnæs carried out a survey of library user education in Norway. A questionnaire was sent out to over 80 libraries, and about two-thirds of these replied. 20 libraries stated that they gave an introduction to computerized information retrieval. These libraries all belonged to the category “university or large research library” such as the Norwegian Institute of Technology, Trondheim, and Oslo and Bergen Universities, see Alnæs, 1985.68 At Oslo university, the first “real course” in the use of MIC’s databases was given in 1985, see Halldal27 and Henschien.69 After initial training at MIC in Stockholm, Oslo university librarians held courses for other Norwegian librarians and many doctors, pharmacists, physiotherapists, and other paramedical professions. “Many doctors referred to the courses given at the library as their first introduction to the use of IT” see Buntz.70 Courses were also available for biologists. Kvam described another interesting course, at the University of Oslo, in which students in the social sciences had the possibility to carry out a free online search, with a print out of up to 150 references, see Kvam, 1985.71 This course was evaluated in detail and Kvam concluded that manual and computer-based information retrieval should be seen as complementary strategies.

In 1986 the Norwegian DIANE Centre was established at the Documentation Centre of the Library of the Norwegian University of Technology in Trondheim, as a national service center. As well as in Denmark the main purpose of the Norwegian DIANE center was to promote and support the use of national and international online services as well as other computerized information services. This was achieved, in part, by means of training courses and seminars for both new and experienced users, and by hosting courses for database producers and systems operators.72 The early courses were directed towards the use of individual databases and telecommunication equipment, see Lamvik, 1987.73 The Norwegian DIANE Centre promoted the use of available
databases, as did the Danish DIANE Centre, irrespective of their country of origin. The Norwegian DIANE Centre also produced the Newsletter “Norsk DIANE Nytt”, which had a wide distribution.

5.5 Sweden

In Sweden, postgraduate courses, which included computerized information retrieval were given at the following universities and colleges, see Fjällbrant, 1982.74

<table>
<thead>
<tr>
<th>Institution</th>
<th>Hours</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Karolinska Institute of Medicine and Surgery, Stockholm*</td>
<td>30</td>
<td>1 per year</td>
</tr>
<tr>
<td>Biomedical Library, Gothenburg University</td>
<td>14</td>
<td>4 per year</td>
</tr>
<tr>
<td>Royal Institute of Technology, Stockholm**</td>
<td>14</td>
<td>1 per year</td>
</tr>
<tr>
<td>Chalmers University of Technology, Gothenburg</td>
<td>70</td>
<td>3-4 per year</td>
</tr>
<tr>
<td>Linköping University</td>
<td>11</td>
<td>3 per year</td>
</tr>
<tr>
<td>Lund UB2 Library</td>
<td>8-10</td>
<td>5 per year</td>
</tr>
<tr>
<td>Swedish University of Agricultural Sciences, Ultuna</td>
<td>4</td>
<td>1 per year</td>
</tr>
<tr>
<td>Skara College of Veterinary Medicine</td>
<td>22</td>
<td>On demand</td>
</tr>
<tr>
<td>Umeå Forrestry College</td>
<td>8</td>
<td>1 per year</td>
</tr>
<tr>
<td>Umeå University (for medical and dental postgraduates)</td>
<td>11</td>
<td>2 per year</td>
</tr>
<tr>
<td>Uppsala University</td>
<td>2</td>
<td>?</td>
</tr>
<tr>
<td>Luleå College of Technology (cooperated with Umeå)***</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Training in the use of MEDLINE has been described by Viveka Alton Lundberg and Per Olsson in 1982. 75

** An article describing experiences from training in the use of IRS–QUEST at the Royal Institute of Technology, was written by Lars Klasén in 1982.76

*** See Haupt, 1987, for description of the courses developed at Luleå University.77

The Hands-on” searching for undergraduate students that was introduced in the late seventies was continued and further developed in the early eighties. The libraries such as the Library of the Royal Institute of Technology, Stockholm, and the Medical Information Centre at the Karolinska Institute, Stockholm, started to have online searches at the undergraduate level, but for many other institutions, this was considered too expensive. The availability of NORDIC databases, over SCANNET, provided an affordable alternative which stimulated active online training – “In 1980 “hands-on” online training was introduced for the civil engineering undergraduates (at Chalmers). They prepared and carried out a search on BYGGDOK – a Swedish database containing some 30,000 references in the field of building and related subjects. This experiment in teaching online information retrieval proved so successful that attempts were made to introduce “active” methods of teaching online into all of the undergraduate courses.” see Hasslöw et al, 1987. 78

An important trend that was, in part, influenced by the work of the NORDINFO Reference Group on User Education, was that many universities started to provide courses for external users. This was strongly supported by the work of the documentation centres and the DIANE centres. Courses were given by both online database producers and systems operators. These were directed towards both information specialists and practitioners particularly in the medical and engineering disciplines. Examples of universities, which provided online training for industrial companies, were the Royal Institute of Technology and the Medical Information Centre (MIC) at the Karolinska Institute in Stockholm. Linköping University specialized in information provision for small and medium sized enterprises – SMEs.79 At Chalmers University, courses for external users were provided, for example, for nursing staff, physiotherapists, occupational therapists and laboratory assistants. Courses for industrial engineers were organized through the auspices of TEMADOC – Technical and MArketing DOCumentation, the industrial service organized by Chalmers Library, in connection with the Chamber of Commerce for Western Sweden, see Fjällbrant and Sjöstrand, 1983.80

One of the problems in teaching online information retrieval with individual exercises was the cost involved. Chalmers Library had a user education programme for over 1000 students per year. As a step in this work, a number of methods were developed. One of these was the use of emulation programs. These consisted of a search system and a local microcomputer database. These had the advantage that they were low cost and available for students at any time for training in constructing search profiles etc. The disadvantages were that the databases – Microcomputers – Toxicology etc. were quite small between 100 to 500 posts, and so did not provide the “real” experience of working with a large database.81 Another method for enabling users to get accustomed to online information retrieval is by the use of simulation programs. Chalmers produced simulation programs for ESA-IRS.
- “QUESTSIM” and for DIALOG – “DIALSIM.” 82 These were later bought and developed by INSPEC as part of their LION training program and were available throughout Europe. The advantage of these programs was that they could provide training in command languages and search strategies. The simulation programmes were purchased by colleges, schools and industrial companies as aids to online training.

5.6 Other activities

In parallel with the work carried out by the universities, there were a number of other initiatives in online training. One example of this is the Norwegian Centre for Informatics (NSI) A/S in Oslo. This company specialized in working with the Polydoc and Micro Polydoc computer-based information systems. In the early 1980s they had 12 databases publicly available for searching – 2 factual and 10 bibliographic. They developed regular user education programmes, which have been described by Pavicevic, 1982.83 NORDINFO supported a project on the development of a computerized program for the training of individual users, independent of location. This was based on a program developed at Agder College in Kristiansand. This individual tutoring program was seen as a complement to traditional courses.84,85 User education from a Nordic database producer's point of view has been described in relation to BYGGDOK, the Nordic database for the building sector, see Stern, 1982.86 The BYGGDOK database was widely used in the online training of civil engineers and architects throughout the Nordic countries. In Sweden, SPRI – Hälso- och sjukvårdens utvecklingstjänst (The Development Service for the Healthcare and Nursing sectors) was responsible for the production of databases such as SPRILINE, which opened in 1985. SPRI also gave a considerable amount of online training. The number of SPRILINE training courses varied from year to year, but was annually considerably more than 10 courses, during the first six years of operation.87

6. The role of NORDINFO in promoting online activity during the 1980s

During the 1980s, NORDINFO promoted the development of online activity in a variety of ways: Through policy development and coordinating activities, library resource, databases and network activity, and education, see Oker-Blom, 1982.88 In the field of education, NORDINFO's activities relate to both training library and information personnel and the training of information users. NORDINFO was responsible for continuing training activities for the trainers and instructors. Joint Nordic training courses in the use of new technology and networks were developed and given for library and information specialists. NORDINFO also continued to support a considerable number of non-database specific and database specific courses. The specific databases were mostly the Nordic databases operating under SCANNET, the library and information dedicated network, which served primarily databases with a Nordic connection, see NORDINFO-Nytt special issue on SCANNET in 1982.89 In the field of user education NORDINFO continued to stimulate “efforts to reach new categories of users in public administration, industrial organizations and other fields.”

Online information retrieval is based on an interaction between the user and the host computer. Therefore training packages were developed such as the software packages for microcomputers – simulation programs such as QUESTSIM and DIALSIM from Chalmers University, STN-MENTOR from the STN host in Karlsruhe and emulation programs such as MICROPOLYDOC from NSI, UNESCO's CDS/ISIS program (see Pobukovsky, 1985),90 and the MIRABILIS program from the University of London Central Information service, see Fjällbrant, 1988 for an overview.91 NORDINFO sponsored two Nordic training courses about the use of microcomputers in libraries. This included building small databases and subsequent searching. These courses were held in February 1985 and in March 1986. A similar course was organized by the Library Association of Iceland, and held in Reykjavik.

The interaction between information searchers and host computers was complicated by the use of a variety of database structures, user-system interfaces and retrieval command languages. Most end-users only used a few databases, and one or two search systems and indeed many felt that “the difficulties were too severe to start searching at all.” Even professional searchers tended to specialize in the use of one or two host systems, see Sormunen and Nurminen, 1987.92

The mid 1980s, saw the beginning of the development of intelligent interfaces, which would aid the user in online searching. In 1985, NORDINFO took the initiative to develop an intelligent interface to NORDIC information systems and databases. This was based on the fact that “Nordic databases, often developed with support from NORDINFO, were rarely used to any significant extent by the potential users once they moved from test phase to commercial operation.” See Hansen & Andersen, 1987/88.93

The ambitious and costly IANI - Intelligent Ånvärdargränsnitt till Nordiska Informationssystem – Project, which was co-sponsored by the Nordic Industrial Development Foundation, started in 1986. The aim of this project was to
facilitate searching in the Nordic databases, and hopefully increase the use of databases containing unique Nordic information. This was developed by the Danish data processing company CRI – Computer Resources International assisted by BRODD – the Consultancy and Development Department of the Norwegian School for Library and Information Science).

The first stage of the project resulted in a report on language requirements for the intelligent interface facility based on the ISO/DIS 8777 standard. This part of the work was carried out by BRODD, see de Brisis and Manders, 1988.94 CRI started work on the production of the IANI interface. The concept included the following:

- one logon/logoff procedure to all databases and hosts
- access via menu or CCL commands according to user's choice
- conversion of user statements to correct CCL expressions in the PC
- help to search formulation and database selection via meta database at the PC
- conversion of CCL commands to host language commands at the PC
- transmission of validated host language commands to the host
- transfer of search results to the PC
- sorting, merging and editing of references in the PC
- presentation on screen and print in host formats or standard IANI-format
- document ordering
- presentation of statistics on session time and costs when information is available from the host.

points that were all formally taught in the former training courses.

This was a very ambitious program, and as could be seen, if successful, would certainly make searching easier for end-users. Indeed there were ideas that user education would become unnecessary or at least could be greatly reduced, so towards the end of the 1980s, user education had a much lower profile in NORDINFO's overall activities. The IANI prototype was tested and subsequently modified. Sales began at the end of 1989. 95,96

7. A few personal reflections about the past and future

During the 1970s and early 1980s, NORDINFO played a very important role in stimulating cooperation between the Nordic producers, distributors and managers of information through a variety of programmes, such as the production of NOSP (the Nordic catalogue of serial publications), the support for SCANNET and the production of a large number of Nordic databases. NORDINFO stimulated the use of these information products by means of education both of library and information staff and users of information. In the latter, there were numerous attempts to reach out to new user groups, such as people working in small industrial concerns, and schools. NORDINFO also contributed to increasing international contacts with other experts from countries outside the Nordic area. This was achieved through support of international workshops, courses and by the Anglo-Nordic seminars. I have been involved in a number of these activities and enjoyed the possibility to gain a Nordic perspective.

Other organisations that strongly supported the development of user education, during this period, were NVBF – Nordiska Vetenskapliga Bibliotekarieföreningen (The Nordic Research Librarians Association), and IATUL – the International Association of University of Technology Libraries, both of which were responsible for the organisation of seminars and workshops on various aspects this topic.

The introduction of problem-based learning (PBL) into the higher education field, has had an important effect on the development of library user education. In PBL there is a focus on the student's own ability to find relevant information about the various projects which are part of the curriculum. At Linköping university, PBL was introduced in the Faculty of Health Sciences in 1987, and Kerstin Fridén has described the role of librarian as a teacher, in this setting. She concludes that user education and information literacy “should be given a high priority and looked upon as a natural part of the library service. Similarly, educational skills must be an integral part of librarianship.” (see Fridén 1992, 1996).97,98 Evaluation studies on user education had clearly demonstrated the importance of linking user education, in its various forms to project work in connection with studies.38,39 From the 1990s onwards, PBL is being introduced into many academic disciplines, and this presents a great opportunity for library involvement.

The 1990s have seen a great many changes, with the increased availability and use of the Internet (for which Nordic academic users were well prepared through the development of SCANNET), and the development of information browsers of various types, which produced general interfaces for searching and obtaining information. Databases became available first on CD-ROM, later through the internet with World Wide Web
interfaces. This has created a popular idea that all (or at least most) of the information is available somewhere out there, and that it is FREE! This is, as information professionals know all too well, not true.

There is a growing emphasis on the need for lifelong learning in all the Nordic countries. Access to a digital library sounds like an ideal solution for people taking part in distance learning programmes. At the present time, this access is often a problem, particularly for people who live in rural areas, where they have poor network facilities. Navigational tools are improving all the time, and these will hopefully be able to respond to individual user profiles in the future. Access to networked material for learning etc. is not necessarily easy today. More people are taking part in trans-disciplinary studies and research, often being involved with one or more universities. They may well have access to one set of licensed material from the university to which they have the “correct” IP address on their computer, but they will probably be denied access to electronic journals from another university. Material used for courses has to be copyright cleared, and assessed for quality. This involves time in the planning and preparation for distance learning courses. Some material of high quality has a high copyright clearance fee. Will people choose less expensive and readily available material instead? There is a need for information specialists and teachers to work together in planning and developing courses, especially if these are networked, see Fjällbrant, 2000.98,100 To paraphrase the words of Sormunen and Nurminen, 1987.92 problems dealing with information access are not solved by technical developments alone. The users need human based help and support on how to find information and evaluate its quality. Those who have worked with users under this period have experienced one of the most exciting times in the development of information handling.

In March 2000, the European Commission published a document called eEurope: An Information Society for All, in Lisbon. eEurope is a political initiative to ensure that the European Union fully benefits for generations to come from the changes that the Information Society is bringing.

The key objectives of eEUROPE are:
- Bringing every citizen, home and school, every business and administration, into the digital age and online.
- Creating a digitally literate Europe, supported by an entrepreneurial culture, ready to finance and develop new ideas.
- Ensuring the whole process is socially inclusive, builds consumer trust and strengthens social cohesion.

In the new millennium, librarians and information specialists have the opportunity to play an important role in lifelong learning and the development of information literacy, both for their traditional academic user groups, and also for the “information disadvantaged” such as the senior citizens. One of the most important challenges for the future is information provision to support lifelong learning. In this connection, I was very pleased to hear at the 25th Anniversary of NORDINFO, held in Helsinki in October 2001 that a Nordic Reference Group for Information Literacy has been formed. We who worked with the development of various types of user education and training in the “old days” would like to wish them every success in the future and may they have as much fun as we did!

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