

*Swedish
Universities &
University Colleges
1994/95*

Short Version of Annual Report

National Agency for Higher Education 1996



The cover picture shows the "Artisten" concert hall at the University of Gothenburg.

Swedish Universities & University Colleges 1994/95

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Introduction

This summary of the 1994/95 *Swedish Universities and University Colleges Annual Report* gives an outline picture of higher education activities in Sweden, both in quantitative and qualitative terms. The Report provides a basic description of the academic structure in Sweden, and the regulatory framework under the heading *The Higher education sector in Sweden in 1994/95*. Subsequent sections of the report summarize developments prior to and including the 1994/95 fiscal year and cover state, regional authority and private universities and university colleges. Analysis in the Annual Report is based on information obtained from a number of sources, including the annual reports published by Swedish universities and university colleges and statistics produced by Statistics Sweden (SCB).

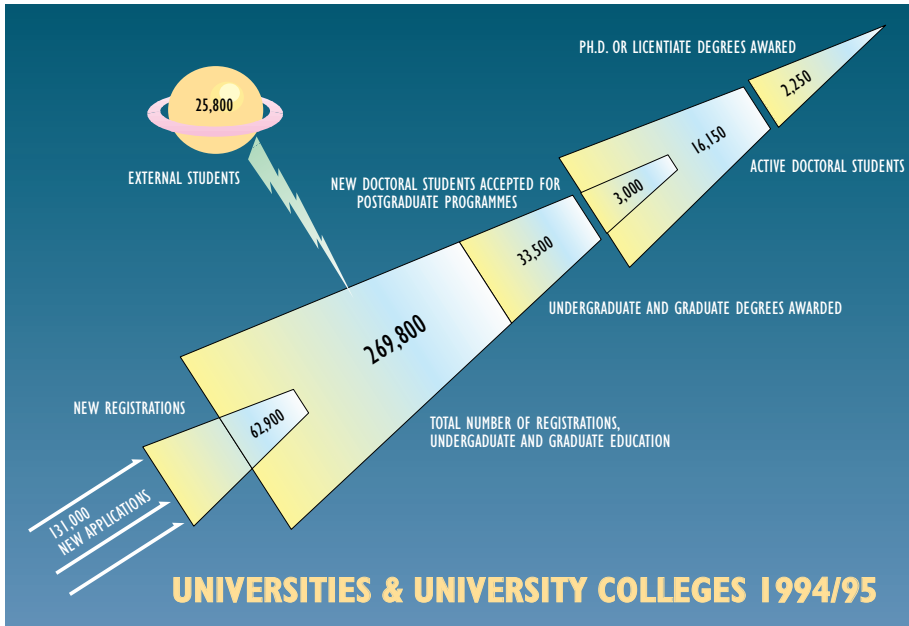


Fig 1. In 1994/95, it was estimated that there were 131,000 new applications for places from people who had not previously participated in higher education. The total number of registrations in 1994/95 was 269,800. 62,900 had not studied previously at university level. 25,800 students took external courses. A total of 33,500 degrees were awarded in the same year. There were 16,150 active doctoral students. 3,000 new doctoral students were accepted for postgraduate programmes and 2,250 were awarded Ph.D. or "Licentiate" degrees.

The Higher Education Sector in Sweden

INTRODUCTION

There have been many changes in the Swedish education system in recent decades. A nine-year obligatory school system and senior secondary schools which offer both vocational training and theoretical programmes have been introduced, and adult education has also been expanded and developed.

Major and fundamental reforms of the higher education system were introduced in 1977 and 1993. In 1977, practically all post-secondary school education was coordinated into the overall concept of higher education. In the 1977–1993 period, there was relatively detailed regulation by the Government and Parliament of the scope and location of higher education. This also applied to the internal organization of university-level institutions.

Further reform of higher education was initiated in the early 1990's, and a new Higher Education Ordinance came into force on 1 July 1993, reducing the powers of central government to exert detailed control over state universities and university colleges. Decisions were decentralized in important areas. General study programmes determined at a central level have been abolished, and a new Degree Ordinance was introduced. Amongst other things, decisions regarding the orientation of undergraduate study programmes were transferred from the state to the institutions concerned, although central government establishes certain targets and frameworks – mainly of a financial nature. Regulations governing decision-making bodies and management principles are in the form of framework provisions. This enables each institution to adapt its organization to comply with its own educational programme. Furthermore, all universities and university colleges are responsible for admissions on the basis of certain framework provisions. Another object of

the 1993 reform was to give students greater opportunities to choose and combine courses in their degree studies. The Degree Ordinance specifies the degrees which are offered.

A new allocation of resources for undergraduate education was introduced in 1993 as part of the wider reform of higher education. Commencing in the 1993/94 academic year, the resources allocated to universities and university colleges have been based on the number of students enrolled at the institution concerned, and the level of achievement. Previously, allocations were based on the activities planned by the institution.

There have also been changes in the central government education authority structure in the 1990's. Universities and university colleges now report directly to the Government.

A new National Agency for Higher Education (Högskoleverket) was set up on 1 July 1995. The new Agency incorporates the Office of the Chancellor of the Swedish Universities (Kanslersämbetet), the Council for the Renewal of Undergraduate Education (Grundutbildningsrådet) and parts of the former National Agency for Higher Education (VHS). The National Agency for Higher Education is a central government authority dealing with issues concerning universities and university colleges. The Agency is assigned to inspect and promote higher education activities, and is responsible for monitoring, evaluation, supervision of entitlement to award degrees, other types of supervision, quality audit and enhancement, pedagogic renewal, information concerning studies and international questions in the higher education sphere.

The National Agency for Procurement and for Coordinated Admission to Higher Education is a separate authority which coordinates student admissions and procurement of equipment. It is mainly financed by universities and university colleges.

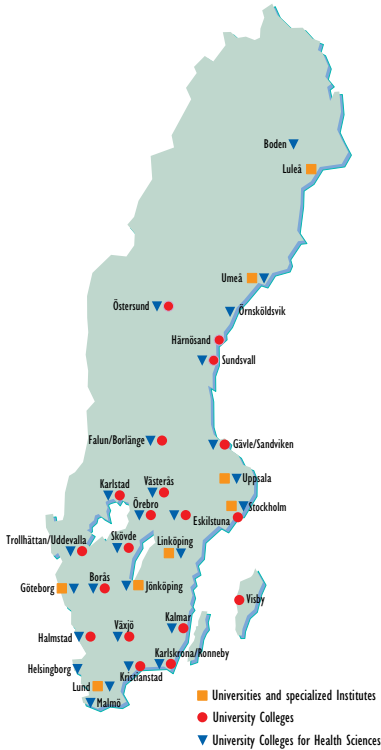


Fig 2. Swedish Universities and University Colleges.

The Council for Higher Education Research (Rådet för forskning om högskolan) finances research in the higher education sphere. The Association of Swedish Higher Education (Högskoleförbundet) is a special interest group encompassing most of Sweden's universities and university colleges.

SCOPE OF THE HIGHER EDUCATION SECTOR

In 1994/95, the state component in the higher education sector consisted of 10 university institutions with regular research resources, 7 university colleges of fine arts in Stockholm and 16 small and medium-sized university colleges, including the Stockholm Institute of Education and the Stockholm University College of Physical Education and Sports. On 1 July 1994, the Chalmers University of Technology and the University College of Jönköping became private foundations and are no longer part of the state sector. The Stockholm School of Economics is another private higher-education institution. In addition, in 1994/95 there were 26 county council and 3 private colleges of health sciences, some of which have subsequently become state university colleges. The Stockholm School of Music Education was granted the right to award degrees in 1994/95, and this also applies to a number of other institutions in the higher education sector.

UNDERGRADUATE EDUCATION

The 1993 reform of higher education represented a complete break with traditional forms of central government regulation of undergraduate education. The former general study programmes determined by Parliament were abolished. In addition, the number of new recruits for each type of study programme is no longer determined at central government level. Instead, each university or university college decides its own study programme and the appropriate organizational structure within the framework of a three-year "educational assignment" approved by Parliament for each institution of higher education. The educational assignment specifies the results which central

government expects in the next three-year period, and the financial framework. The allocation of resources is decided at the local level.

As from 1 July 1993, all undergraduate higher education is to be in the form of courses which may be combined into a study programme based, to a greater or lesser extent, on individual choice. Students can also combine different types of courses in a degree programme.

The scope of a study programme or course is measured in terms of credits. One credit corresponds to one week of full-time study. An academic year normally consists of 40 credits, usually divided up into an autumn and a spring term. In addition, some universities and university colleges offer summer programmes.

The Degree Ordinance specifies the degrees which can be awarded and the objectives. The Ordinance also states the scope of the programmes leading to a degree. Courses and study programmes are determined by the institution concerned. Undergraduate degrees are classified either as general degrees or professional degrees.

General degrees

A master's degree is awarded after studies totalling not less than 160 credits (four years of full-time study). The requirements are in-depth studies at the 80 credit level in the principal subject and an independent study for which at least 20 credits have been awarded, or two 10-credit projects.

A bachelor's degree calls for studies totalling not less than 120 credits (three years of full-time study). In-depth studies at the 60 credit level and an independent project corresponding to at least 10 credits are required.

A university diploma is awarded after studies of at least 80 credits. The orientation is determined by the institution concerned.

Professional degrees

In addition to general degrees, there are some fifty professional degrees for which specific objectives are laid down in the Degree Ordinance. Medical qualifications, engineering degrees, agronomics degrees and compulsory-school teaching diplomas are examples of such professional degrees.

Admission to undergraduate education

Applicants for undergraduate education must comply with the general admission requirements, which are identical for all types of courses and programmes. Any student who has completed a national upper secondary school programme or the corresponding studies in Sweden or some other country complies with these admission requirements. This also applies to students who are at least 25 years old and have not less than four years of active experience of working life and a knowledge of English and Swedish corresponding to completion of a national upper secondary school programme. Certain transitional provisions apply prior to the year 2000.

Most courses and study programmes have special admission requirements which may vary, depending on the subject area and the type of course. These requirements are determined by the university or university college concerned.

If the number of applicants exceeds the number of places for new students, a selection process must be instituted. Universities and university colleges determine these requirements within the scope of the generally applicable frameworks specified in the Higher Education Ordinance for the selection criteria which are to be applied, and whether student admissions are to take place at the local level or are to be coordinated by the The National Agency for Coordinated Admission to Higher Education. In addition to upper secondary school grades, the predominant instrument in the selection process is the national university aptitude test. This test is common to all higher education programmes and it measures knowledge and skills which are important for higher education studies. Apart from

upper secondary school grades and the aptitude test, applicants may also be selected on the basis of special tests, for example interviews or proficiency tests, previous education and experience of working life.

In 1994/95, the rules for admission have been the subject of an official special inquiry which has followed up the 1993 reform (SOU 1995:41 and 1995:71). Parliament is expected to decide on the proposals made by this inquiry in the spring of 1996.

Study support

Students have access to state support to finance their higher education studies. This support consists of a study grants and study loans which, in combination, constitute "student aid". Certain requirements must be met if a student is to receive student aid. If the student has an alternative source of income, student aid may be reduced and, if a student is to receive student aid over a period of several years, he or she must maintain a specified study tempo. In 1995, the grant component for an academic year of nine months amounted to SEK 17,400 and the maximum loan sum was SEK 45,200. In other words, the maximum student aid for full-time studies in 1995 was SEK 62,600.

Financial support for students is currently subject to consideration by an official inquiry, and a report will be published in the spring of 1996.

POSTGRADUATE STUDIES

Postgraduate studies are offered at institutions of higher education organized on faculty lines, that is to say the universities, the Karolinska Institute, the Royal Institute of Technology, the Chalmers Institute of Technology, the Luleå University and Institute of Technology, the Swedish University of Agricultural Sciences, the Stockholm School of Economics and the University College of Jönköping. Postgraduate studies are also arranged at many other university colleges in cooperation with other institutions which have a faculty structure.

Postgraduate studies involve a nominal 160 credits (four years) and lead to a doctoral degree (PhD). A licentiate degree, which requires at least 80 credits, may be awarded after two years.

Postgraduate studies are based on undergraduate studies totalling at least 120 credits with at least 60 credits in the area of postgraduate study. In addition, the faculty board concerned determines other requirements for admission to postgraduate studies within its area of competence. There is also an assessment of the applicant's suitability and capacity to complete doctoral studies.

A doctoral student must complete a number of courses and write a doctoral thesis. Each student is entitled to personal tutoring. The doctoral thesis, which is the most important aspect of postgraduate studies, must be defended publicly. A doctoral degree calls for approved completion of courses and approval of the thesis.

Postgraduate study support

Postgraduate studies are financed from the faculty allocation. In addition, external funding is frequently available, for example from research councils. Faculty boards decide whether earmarked resources are to be employed for postgraduate studentships or for study grants. Both studentships and grants cover a period of four years. A grant may also be split between two postgraduate students. A postgraduate student who has a studentship must concentrate on his or her studies, but may also undertake teaching or other duties to a limited extent. Combining studies with participation in a research project, which may receive external funding from a research council or sectoral body, is a relatively common way of financing postgraduate studies.

R E S E A R C H

Sweden's expenditure on research and development (R&D) was 3.3 per cent of GDP in 1993, according to Statistics Sweden. This was the highest figure in the OECD area. The higher education sector accounts for about a quarter of the resources devoted to R&D. Three fourths of R&D activities are carried out in the corporate sector and by non-university areas of the public sector. R&D conducted by companies concentrates on certain industries and high-technology products, with a primary focus on development activities, while R&D in higher education focuses on basic research and applied research.

The predominant proportion of publicly financed research is carried out at universities and other institutions of higher education. Independent research institutes only participate to a limited extent. As a result, higher education plays a crucial role in the Swedish research system, not merely because it constitutes the traditional base for research and postgraduate studies, but also because it undertakes commissioned assignments for sectoral bodies and for industry. Research activities are obviously also highly relevant for undergraduate education.

Research and postgraduate studies are mainly pursued at universities and other higher education institutions which are organized on faculty lines, but also to an increasing extent at other university colleges. Research at small and medium-sized university colleges is financed by government allocations to support research activities and via research councils, sectoral research bodies and commissioned assignments from industry, public authorities, municipalities and county councils. Small and medium-sized university colleges have recently been allowed to appoint professors, subject to approval by the National Agency for Higher Education.

FINANCING OF HIGHER EDUCATION AND RESEARCH

As part of the reform process, a new resource allocation system for undergraduate education was introduced on 1 July 1993. This system means that universities and university colleges are given an educational assignment before the commencement of each three-year period. This assignment specifies the objectives and frameworks for activities in the period concerned. The allocation of resources depends on results in the form of students (calculated in terms of the number of full-time equivalent students) and study achievements (in terms of full-time equivalent performance) at each institution. These principles apply to state universities and university colleges, and private institutions. Agreements with private institutions are regulated by special contracts.

The educational assignment specifies the minimum number of certain types of degrees which are to be awarded by the institution in the three-year period and the maximum number of full-time equivalent students for which the institution can receive payment in the current fiscal year. The educational assignment also specifies a ceiling figure for the maximum total payment for full-time equivalent students, and the achievements quota for the fiscal year. In many cases, special commitments which may lead to special compensatory payments are also defined for most institutions.

The sums to be paid for full-time equivalent students and achievements are determined on an annual basis by central government and stated in the official directions for the use of appropriations. These sums differ for different subject areas. All courses in these subject areas are classified for universities and university colleges. This classification determines the compensation paid. The sums payable for the 1994/95 fiscal year are presented in Figure 3.

In the case of the fine arts and physical education, payment for full-time equivalent students in the 1994/95 fiscal year is made on a special basis for each of the institutions concerned.

Subject area	Payment per full-time equivalent student (SEK)	Payment for full-time equivalent achievement (SEK)
Humanities	14 024	14 349
Theology		
Law		
Social sciences		
Science	38 036	33 850
Technology		
Pharmacy/pharmacology		
nursing		
Odontology	34 743	42 035
Medicine	46 840	59 314
Education*	27 362	33 547
Other**	31 939	26 777

* Education methodology aspects of teacher training programmes

** Journalist and librarian programmes and practical/artistic courses in teaching training programmes, excluding courses in the fine arts area

Fig. 3 Undergraduate programmes payments, fiscal year 1994/95.

Research and postgraduate training are financed by means of special central government appropriations allocated to faculties at universities and university colleges with a faculty structure. There is also a special budget item for rent of premises. Certain conditions are attached to these appropriations. A certain proportion of allocations must be used for postgraduate study support, for example. A special appropriation for fine arts development is devoted to institutions which offer such programmes.

In addition to these allocations for undergraduate education and for research/postgraduate studies, there are also specially earmarked allocations, for example for measures to support research at institutions which lack regular research resources, for clinical training and research, for the technical-scientific basic year, and for summer courses and external studies.

Appropriations of this kind, which are allocated directly to state universities and university colleges, represent about 70 per cent of the resources of these institutions. The remainder consists of external funding for research and commissioned assignments. The major external sources of funding are public authorities such as research councils, sectoral bodies and local authorities. The public sector provides about 90 per cent of the financial resources employed by universities and university colleges.

INTERNAL ORGANIZATION OF HIGHER EDUCATION INSTITUTIONS AND TEACHING POSTS

One consequence of the 1993 reform of higher education is that universities and university colleges now largely determine their own internal organizational structure. The Higher Education Act and the Higher Education Ordinance contain certain outline provisions, for example concerning the management structure and the composition of certain decision-making bodies.

As in the past, each university or university college is managed by a board chaired by the Vice-Chancellor, who is also the head of the university or college and its foremost representative.

Apart from the Vice-Chancellor, the board contains up to 14 ordinary members, the majority of whom are appointed by the Government. The board also includes elected representatives of the teaching staff, and students are entitled to choose at least two representatives. Employee representatives are entitled to attend meetings of the board and to express their views.

Vice-Chancellors are appointed by the Government for a period of not more than six years, following a proposal made by the board. Selection of the board's candidate is based on an election held in accordance with specially prescribed rules. Other board members are appointed for a period of not more than three years. One or more Pro-Vice-Chancellors may deputize for the Vice-Chancellor. Universities or university colleges may also appoint Deputy Vice-Chancellors to whom some aspects of the Vice-Chancellor's responsibilities may be delegated.

All higher education institutions with a faculty structure must have faculty boards which are responsible for research and postgraduate studies. If a university or university college does not establish a special decision-making body for undergraduate education, faculty boards also assume responsibility for undergraduate studies in their fields. Faculty boards are chaired by the Dean of the faculty. Teachers must always be in a majority in decision-making bodies concerned with research and education. Students are entitled to have at least two representatives on faculty boards and other decision-making bodies which deal with educational matters.

Apart from these regulations for university and faculty boards, universities and university colleges are free to decide their own internal organization and determine what kind of decision-making bodies and committees they wish to have.

The Higher Education Ordinance contains provisions regarding the teaching positions which may be established at universities and university colleges – professorships (including visiting professors), lectureships (including Nordic and foreign lecturers),

and posts for junior lecturers, research assistants, part-time teachers and visiting lecturers. One of the important new features of the 1993 reform of higher education is that the Government and Parliament are no longer entitled to decide on the establishment of professorships or to appoint professors. Instead, such decisions are now taken by the boards of university institutions with regular research resources. Professorships are established by vice-chancellors or, in special circumstances, by the Government. As from 1 July 1995, professorships may also be established at other institutions, after special application to the National Agency for Higher Education.

A university or university college may appoint a senior lecturer who has demonstrated particular proficiency to be an assistant professor.

Trends and Developments

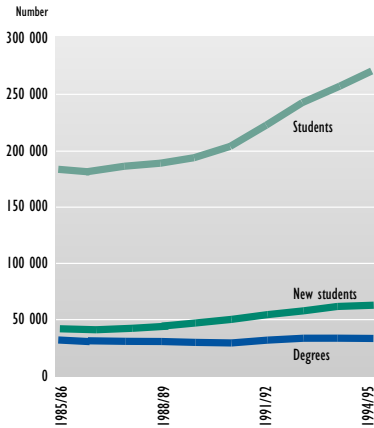


Fig. 4 Students and degrees, 1985/86-1994/95

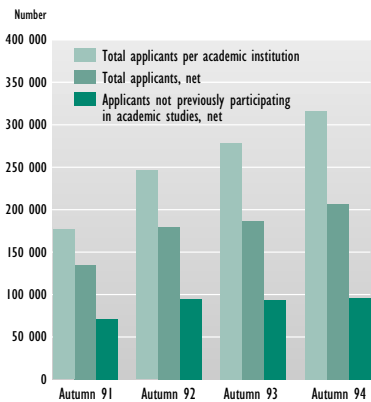


Fig. 5 Number of applicants to universities and university colleges in the autumn term, 1991-1994.

Note: The number of applicants per institution of higher education exceeds the net number of individual applicants because some applicants applied to several institutions simultaneously.

UNDERGRADUATE EDUCATION

Student Inflow

There is considerable interest in higher education. The proportion of young people who commence university or university college studies before they are 21 has almost doubled in the past five years, and represented 24 per cent of this age group in the 1994/95 academic year. In the 1990's, the total number of individuals applying for higher education programmes has increased year by year, and there are insufficient places to meet the demand. It is estimated that roughly one third of all those who apply in any particular term must be refused a place in higher education. There has been some improvement in the last two years in the balance between the overall demand, measured in terms of the number of applicants, and the supply, in terms of the number of new students who are accepted. There is, however, considerable variation between different study programmes and institutions.

Student Stock

Almost 270,000 individuals studied at Swedish universities and university colleges in the 1994/95 academic year. This represents an increase of more than five per cent compared with the previous academic year. The proportion of women was 57 per cent, and there were 62,900 new recruits to higher education. This is clearly a smaller increase than in the earlier years of the decade. The current trend is a reduced rate of expansion in the total number of students in higher education and a decline in the increase in the number of new students. In fact, the number of new students under the age of 22 has decreased somewhat since the 1993/94 academic year. Amongst other things, this reflects a smaller total population in the age group in question. The proportion of students under the age of 25 has increased from 43 per cent to 50 per cent in the past ten years. However,

compared with other countries, Swedish students in higher education still have a high median age.

In the 1990's, teaching capacity in undergraduate education increased by about 50 per cent. In the 1994/95 academic year, there were 217,600 full-time equivalent students, which represents an increase of 3.4 per cent compared with the previous academic year.

Student Outcome

The expansion of higher education is now beginning to produce results in the form of more degrees. There has been a considerable increase in the science and technology area, where there has been a 16 per cent rise in the number of degrees awarded. In the case of engineering, 3,300 degrees were awarded in the 1994/95 academic year – a dramatic increase of 25 per cent. A growing number of degrees involve academic studies of three years or more. 59 per cent of those who received degrees in the 1994/95 academic year were women.

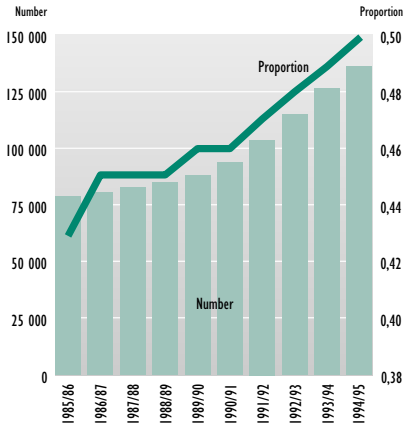


Fig. 6 Number and proportion of students under the age of 25, 1985/86-1994/95.

CROSS-BORDER STUDENTS

It is estimated that approximately 18,000 Swedish students participated in higher education studies in other countries for the whole or part of the 1994/95 academic year. About 14,000 of them made their own arrangements for studies abroad, while the remainder took part in student exchange programmes, the largest of which was the EU Erasmus programme. The United States, Great Britain and France were the most popular countries with Swedish students who studied abroad.

In the case of foreign students who studied in Sweden, it is difficult to draw a clear distinction in the statistics between temporary guest students and citizens of other countries permanently domiciled in Sweden. The records of Swedish institutions of higher education indicate that about 3,800 guest students/foreign students studied in Sweden at some period in the 1994/95 academic year. This is an underestimate, since several institutions have been unable to report any figures. According to Statistics Sweden, 11,100 persons with foreign

citizenship were registered in higher education programmes in Sweden in the autumn term of 1993.

INTEREST IN TECHNICAL AND SCIENTIFIC EDUCATION

In recent years, several measures have been taken to encourage interest in technical and scientific study programmes and improve recruitment. Special efforts are being made to increase the proportion of women participants.

In the autumn term of 1992, a technical/scientific “basic year” was introduced on a large scale, in order to improve recruitment to technical and scientific higher education programmes. The basic year is primarily targeted at students who took social science or economics courses at the senior secondary school level. In the 1994/95 academic year, almost 1,800 individuals were registered for the basic year, more than half of them women. Approximately 60 per cent of these basic year students subsequently participated in a technical or scientific higher education programme.

MEDIUM-LENGTH HEALTHCARE TRAINING PROGRAMMES

The National Agency for Higher Education has evaluated 113 study programmes conducted at Sweden’s 31 university colleges of health sciences. These programmes lead to 12 different professional degrees and university diplomas. 69 of these programmes have proved to be of university standard, while 44 did not meet this criterion.

In the 1994/95 academic year, students participating in medium-length healthcare programmes constituted approximately 10 per cent of the total number of students in higher education. healthcare programmes were conducted by 31 institutions in 53 locations in Sweden. In most cases, regional authorities are responsible for colleges of health sciences. A total of almost 21,000 full-time equivalent students participated in healthcare programmes, the largest of which was the registered nurse training programme, involving 8,400 students.

POSTGRADUATE DEGREE PROGRAMMES

There continues to be an increase in the number of students commencing postgraduate studies. Almost 3,000 doctoral students were accepted for postgraduate studies in the 1994/95 academic year. The number of women commencing postgraduate studies has doubled in the last ten years, and the proportion of women in this group has risen from 30 per cent to about 40 per cent.

There were 16,100 active research students (degree of activity greater than ten per cent) in the 1994/95 academic year – 700 more than the previous academic year. The proportion of women in the active category has also increased, amounting to approximately 37 per cent in the spring of 1995. The highest proportion of research students studied technical and mathematics/science subjects (37 per cent) or medicine (23 per cent). 20 per cent of active postgraduate students studied social sciences and 15 per cent were attached to an arts faculty.

17 per cent of doctoral students were foreign citizens. A high proportion of these foreign postgraduate students came from the People's Republic of China.

Active research students financed their studies in various ways. Approximately 5 per cent received postgraduate study grants, 37 per cent had postgraduate studentships and almost 42 per cent had some other form of funding, for example scholarships, university posts or other employment connected with postgraduate training, etc. In addition, approximately 1,150 doctoral students received student aid provided by the National Board of Student Aid.

Research and postgraduate training is also conducted at small and medium-sized university colleges, with links with a university or a specialized institution of higher education where the postgraduate student is enrolled and registered. In the 1994/95 academic year there were almost 800 registered doctoral students at small and medium-sized university colleges.

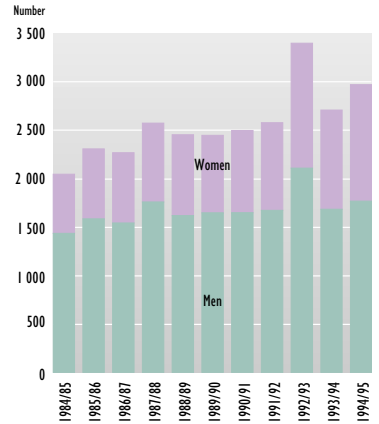


Fig. 7 New recruits to postgraduate education, 1984/85-1994/95

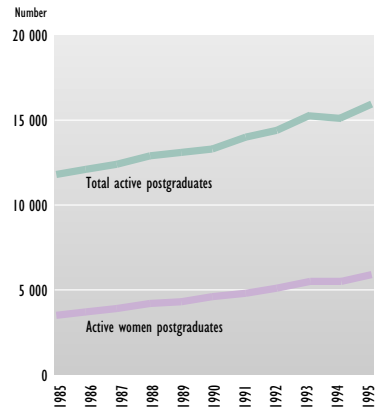


Fig. 8 Active doctoral students in postgraduate education, 1985-1995

Source of funding	SEK million	%
Faculty allocation	6 037	43,5
Other R&D allocations	1 607	11,6
Government authorities	1 957	14,1
Research councils	1 684	12,1
Swedish non-profit organizations	785	5,7
Swedish companies	594	4,3
Local authorities	192	1,4
Foreign companies	127	0,9
Foreign non-profit organizations	97	0,7
EU	52	0,4
Government corporations	35	0,2
Financial revenue (interest and own funds)	338	2,4
Other	362	2,6
Total	13 868	100,0

Fig. 9 Revenue for research and postgraduate education for all higher education institutions, fiscal year 1994/95.

Faculty	Faculty allocation (SEK million)
Technology	1 041
Medicine	937
Mathematics/science	718
Agriculture	690
Social sciences	541
Arts/humanities	447
Technology/science (Only Uppsala)	274
Odontology	97
Law	54
Thematic research (Only Linköping)	44
Pharmacy/pharmacology (Only Uppsala)	37
Theology	34
Fine arts development	23
Philosophy (Only Linköping)	10
Botanic gardens (Gothenburg)	8
Rent of premises	1 085
Total	6 037

Fig. 10 Faculty allocations, by faculty, 1994/95. (Faculty allocations represent approx. 44% of research funding.)

There has been an increase of almost 70 per cent in the number of doctoral degrees awarded over the past ten years. According to preliminary Statistics Sweden data, 1,520 doctorate and 725 licentiate degrees were awarded in the 1994/95 academic year, and the proportion of women PhD's was almost 33 per cent – two percentage points higher than the previous year.

RESEARCH

The higher education sector accounts for about one-fourth of the total resources for research and development in Sweden. Three-fourths of R&D activities are carried out within the private sector and the public sector outside universities and university colleges.

In the 1994/95 fiscal year, revenue for research and postgraduate research training at Swedish universities and university colleges was SEK 13.9 billion. About 55 per cent of these resources took the form of government faculty allocations and other R&D allocations. The remainder came from research councils, other government authorities and public utilities, local authorities, companies, etc. The overwhelming proportion of R&D resources (98 per cent) went to universities and institutions with permanent research resources.

The number of R&D man-years carried out is another way of measuring the volume of R&D. The technical and medical science areas are the largest in volume terms, followed by the social sciences and the mathematics/science areas. The technical/mathematics/scientific field is clearly the largest in terms of the total number of man-years. The cost of research and postgraduate education is yet another way of measuring R&D in subject area terms. In this case, medicine, mathematics/science and technology are the major research areas, both in cost and volume terms.

In the fiscal years 1993/94 and 1994/95, when universities and university colleges were allowed to establish professorships on

an independent basis, the number of professorships rose from 2,109 in fiscal year 1992/93 to 2,228 in fiscal year 1994/95 – an increase of 119. The social science faculties were responsible for the greatest increase – 48 posts (19 per cent). In the arts faculties, there was a 7 per cent increase, but in the technical and mathematics-scientific faculties, the increase was only 3 per cent.

There has been a steady increase in scientific publication by Swedish researchers in the past decade. According to the preliminary figures for 1995, the number of articles by Swedish authors is continuing to increase. In terms of the number of articles published, Swedish researchers are maintaining their position well. Sweden's research profile is broadly reflected by the range of scientific articles published. If the total number of articles is correlated with population, Sweden takes second place after Switzerland in an international ranking of OECD countries. Throughout the 1990's, there has been a marked increase in joint authorship across national borders, and there has also been a rise in the number of articles co-produced by researchers at other Swedish universities.

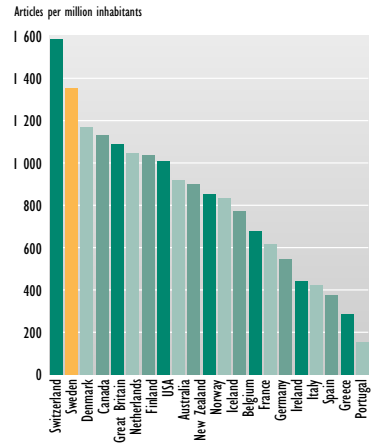


Fig. 11 Number of published scientific articles per million inhabitants, 1995 (Jan.-Nov.).

EVALUATION AND QUALITY ENHANCEMENT

Systematic efforts have been devoted to quality enhancement in the higher education sector, although quality enhancement programmes may vary from one institution to another. An increasing number of institutions have established special quality groups to coordinate development efforts. In certain cases, however, special quality functions have not been instituted since it is claimed that quality enhancement should be an integrated aspect of all activities. Several higher education institutions plan quality programmes in three-year cycles, in line with the budget process. There is a greater degree of systematic cooperation in quality development questions, and regular meetings of liaison contacts and coordination groups take place under the auspices of the National Agency for Higher Education.

	1990	1991	1992	1993	1994	1995*	1990's total
USA	1092	1229	1294	1344	1509	1419	7887
Great Britain	405	427	575	529	635	548	3119
Germany	342	348	512	524	585	572	2883
Denmark	272	285	426	444	472	438	2337
France	219	247	322	353	421	364	1917
Finland	180	199	254	271	357	321	1582
Norway	208	208	286	249	311	319	1581
Italy	159	179	229	255	288	261	1371
Netherlands	125	130	211	226	280	234	1206
Canada	153	125	183	204	235	211	1111
Switzerland	126	142	181	181	237	208	1075
Japan	119	136	170	195	216	180	1016

* Preliminary, November 1995

Fig. 12 Number of published scientific articles (SCI) co-authored with researchers in other countries, 1990-1995. (An article may be written by authors from several different countries.)

Measures to improve the student's study situation include new methods of teaching. Various models for course evaluation are common. Local evaluations of an entire university or university college, study programmes, subjects or courses are carried out as one aspect of a continuous quality process.

The Council for the Renewal of Undergraduate Education is responsible for supporting measures to develop the quality of undergraduate education and promote pedagogic renewal. In the 1994/95 academic year, nearly SEK 12 million was allocated from project funds for projects initiated by university and university college teachers. The Government has also assigned the Council to work for the integration of environmental studies into other programmes. An environmental data base has been built up and library staff have been trained in searching in international environmental data bases. The Council has supported five projects covered by the framework for government efforts to increase recruitment of women to scientific and technical study programmes. This has resulted in a marked increase in the proportion of women participating in these programmes.

TEACHERS AND OTHER STAFF AT UNIVERSITIES AND UNIVERSITY COLLEGES

In the 1994/95 academic year, teachers and other staff at Swedish universities and university colleges contributed the equivalent of nearly 43,000 man-years. This is an increase of almost 5 per cent compared to the previous academic year. Nearly 20,000 of these man-years were undertaken by teachers and researchers, while 6,000 were carried out by holders of postgraduate studentships. Professors were accounted for approximately 10 per cent of the total figure for teachers, while junior and senior lecturers were accounted for 60 per cent. On average, 51 per cent of teachers and researchers had a doctoral degree. The figure for universities and specialized institutions of higher education was 66 per cent, compared with 21 per cent at small and medium-sized university colleges.

Over the last three years, personnel resources at state universities and university colleges increased by 10 per cent. The small and medium-sized university colleges have increased by a full 33 per cent. The corresponding figure for universities varied between 10 and 20 per cent while personal resources at specialized institutions of higher education were approximately unchanged.

EQUALITY BETWEEN WOMEN AND MEN
 Equality between women and men in higher education is a very topical issue. The importance of expediting and intensifying efforts to achieve a fairer balance between men and women in higher education was emphasized in a Government Bill (Bill 1994/95:164).

In the 1994/95 academic year, 57 per cent of the undergraduate students were women. On the whole women achieved more credits per term/academic year than male students. On average, the performance rating (number of full-time equivalent achievements/number of full-time equivalent students) for women was 85 per cent in all subject areas, compared with 80 per cent for men. Figure 13 shows the performance of women and men in different subject areas. In the 1994/95 academic year, 59 per cent of all those awarded degrees were women.

The percentage points of women at postgraduate level has increased by about seven per cent over the past 10 years. The percentage points of women awarded doctoral degrees has increased by two per cent since the 1993/94 academic year.

In October 1994, 29 per cent of teachers in higher education were women and 71 per cent were men. The proportion of women in appointments requiring a PhD qualification was low. Only 7 per cent of professorships were held by women. The corresponding figure for senior lecturers was 22 per cent and for postdoctoral fellows 26 per cent. The position is not static, however. The proportion of women teachers has increased over the past three years – by 1 percentage point in the case of professors and by 3 percentage points for senior lecturers and postgraduate fellows.

Subject area	Achievement %	
	Women	Men
Humanities	77	78
Theology	78	79
Law	86	83
Social sciences	78	75
Natural science	86	77
Technology	84	82
Pharmacy/pharmacology	99	96
Nursing	93	91
Odontology	96	95
Medicine	95	86
Education	96	93
Fine arts	82	86
Other	92	87
Total	85	80

Fig. 13 Levels of attainment for women and men, academic year 1994/95.

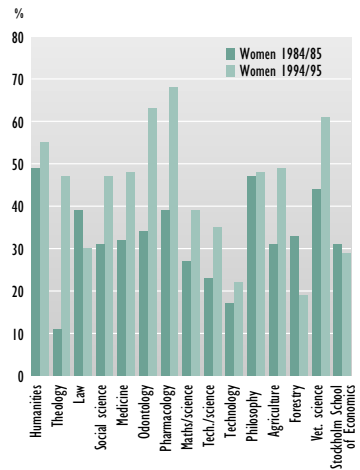


Fig. 14 Proportion of women amongst new students admitted to postgraduate education, 1984/85-1994/95

Various activities designed to promote equality are being undertaken by Swedish universities and university colleges. Most institutions present their achievements in the equality sphere in their annual reports. A considerable number of studies and reports on differences between the sexes were carried out and presented in the 1994/95 academic year. They included the views of men and women on the study environment in the engineering degree programmes, career prospects for women researchers, representation on boards and committees, pay differentials, etc. Some institutions have introduced new study programmes adapted to women students. Measures to make it easier for women to proceed to postgraduate studies are discussed in several annual reports. Such measures include mentor programmes and networks for women research students, posts for women with postgraduate training, management training programmes for women researchers, etc.

Following a decision by Parliament, special funds have been allotted to some 15 universities and university colleges for measures to improve equality between women and men. Projects financed from these funds in 1994/95 included international exchanges of doctoral students, scholarships for women researchers, more women teachers, networks for women, etc.

FINANCES

In terms of the total cost of the education system in relation to GDP, Sweden invests heavily in education. Sweden heads the OECD international statistics for education expenditure on compulsory and upper secondary school education, and Sweden is roughly in the middle of the scale as regards resources devoted to higher education. (Figure 15).

The cost per student in higher education in comparison with the cost for children in compulsory schooling varies considerably from country to country. Ireland and Switzerland spend 4 and 3.6 times more per capita, respectively, for students in higher education than for children in compulsory schooling. In the case of Sweden, the figure is 1.5, which puts Sweden at the bottom of the list, together with Italy.

It is estimated that total expenditure for higher education was SEK 31.5 billion in fiscal year 1994/95. This figure includes the cost of education and research/postgraduate degree programmes at government, regional authority and private universities and university colleges, and the cost of central government authorities and study grants to students in higher education. As a basis for comparison, the total cost of the entire Swedish educational system in calendar year 1994 was SEK 113.7 billion (state and local authority compulsory and upper secondary education, municipal adult education and higher education, including financial support for students). Folk high school and other adult education activities cost a further SEK 2.4 billion.

Direct state and regional authority grants accounted for 70 per cent of the revenues reported by higher education institutions. The remaining 30 per cent consisted of research grants by research councils, etc. and revenue produced by commissioned activities. The revenue reported for commissioned education programmes totalled SEK 617 million in the 1994/95 fiscal year. Revenue for commissioned research amounted to SEK

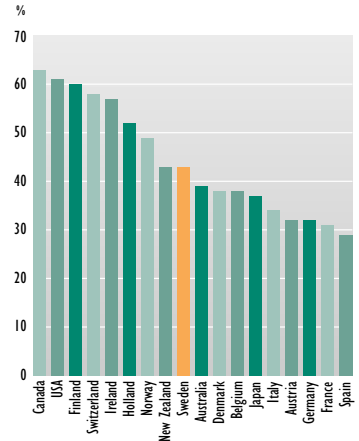


Fig. 15 Cost per student in post-senior secondary school education, 1992, expressed as a percentage of per capita GDP (1992). Source: OECD, Education at a Glance, 1995.

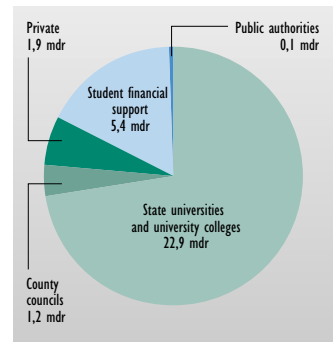


Fig. 16 Allocation of total expenditure in the higher education sector in fiscal year 1994/95 (SEK billion). The total cost was SEK 31.5 billion.

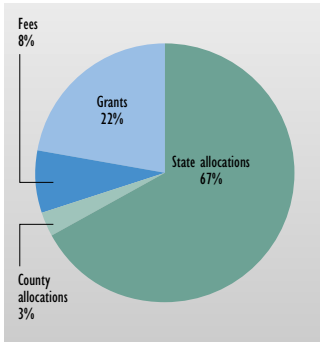


Fig. 17 Sources of operational revenue in fiscal year 1994/95 for state, regional authority and private institutions of higher education. Total reported revenues were SEK 27,506 million.

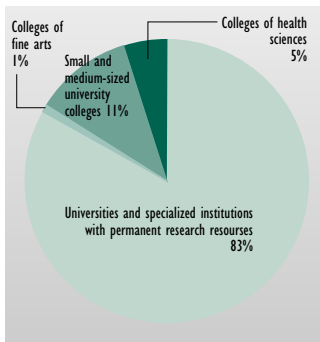


Fig. 18 Percentage allocation of operational expenditure for state, regional authority and private universities and institutions of higher education, fiscal year 1994/95.

620 million. This means that total revenue for all types of commissioned activities at universities and university colleges was SEK 1.2 billion in the 1994/95 fiscal year, which is more than four per cent of total revenue.

Direct government allocations accounted for 67 per cent of university and university college operational revenues in the 1994/95 fiscal year. County council allocations, mainly to colleges of health sciences, accounted for 3 per cent of the total. Fees and other payments (i.e. external revenues resulting from commissioned education programmes, commissioned research, undergraduate programmes undertaken on behalf of other higher education institutions and “special activities”) represented 8 per cent of the total. Revenues from contributions (i.e. external revenues for normal undergraduate and research/postgraduate programmes) accounted for 22 per cent of revenue. These contributions were mainly earmarked for research/postgraduate education.

Universities and institutions with permanent research resources represented 83 per cent of expenditure on higher education. The corresponding figure for small and medium-sized university colleges was 11 per cent, for colleges of health sciences 5 per cent, and for university colleges of fine arts 1 per cent.

Facts about the Higher Education Sector in 1994/95

Students and Teachers	1994/95	Change from 1993/94	Proportion of kvinnor 1994/95
New higher education students	62,900	+1.8 %	56 %
Registered undergraduates	269,800	+5.2 %	57 %
Undergraduate degrees	33,500	-0.6 %	59 %
Active research students	16,150	+6.9 %	37 %
New postgraduate students	3,000	+9.8 %	40 %
Doctoral degrees	1,520	+5.5 %	33 %
"Licentiate" degrees	725	+8.2 %	27 %
Total full-time equivalent students (net) of whom	217,600	+3.4 %	
Universities and specialized institutions	142,960		
Small and medium-sized university colleges	55,140		
University colleges of fine arts	1,990		
University colleges of health sciences	20,070		
Total full-time equivalent achievements of which	181,350	+5.1 %	
Universities and specialized institutions	82 %		
Small and medium-sized university colleges	79 %		
University colleges of fine arts	98 %		
University colleges of health sciences	93 %		
Personnel (man-year) at state, regional authority and private universities and university colleges of which teachers	43,000 20,000		
Proportion of teachers with doctoral degree	51 %		
Costs, M SEK			
Total higher education cost of which	31,500		
State universities and university colleges	22,900		
University colleges of health sciences	1,200		
Private universities and university colleges	1,900		
Student financial support	5,400		
Other	100		
Net operational cost of state universities and university colleges of which	22,900		
Universities and specialized institutions	19,850		
Small and medium-sized university colleges	2,890		
University colleges of fine arts	310		

Universities and University Colleges in Sweden 1994/95

UNIVERSITIES AND SPECIALIZED INSTITUTIONS WITH PERMANENT RESEARCH RESOURCES

State

Uppsala University
Lund University
Gothenburg University
Stockholm University
Umeå University
Linköping University
Karolinska Institute
Royal Institute of Technology
Luleå University College and Institute of Technology
The Swedish University of Agricultural Sciences

Private-sector

Chalmers University of Technology
Stockholm School of Economics
University College of Jönköping

UNIVERSITY COLLEGES

State

University College of Borås
University College of Falun/Borlänge
University College of Gävle-Sandviken
University College of Halmstad
University College of Kalmar
University College of Karlskrona/Ronneby
University College of Karlstad
University College of Kristianstad
University College of Skövde
University College of Trollhättan/Uddevalla
University College of Växjö
University College of Örebro
Stockholm University College of Physical Education and Sports
Stockholm Institute of Education
The Mälars Valley University College
Mid-Sweden University College

Private-sector

Erica Foundation
Johannelund Theological Institute
Stora Sköndal Foundation
Stockholm University College of Theology
Örebro Theological Seminary

UNIVERSITY COLLEGES OF ARTS

State

University College of Dance
University College of Film, Radio, Television and Theatre
University College of Arts, Craft and Design
University College of Fine Arts

Royal University College of Music
Stockholm University College of Opera
Stockholm University College of Acting

Regional Authority

Ingesund University College of Music

Private-sector

University College of Music Education in Stockholm

UNIVERSITY COLLEGES FOR HEALTH SCIENCES

Regional Authority

Blekinge International University College for Health Sciences
Bohuslän College for Health Sciences
Jönköping University College for Health Sciences
Stockholm University College for Health Sciences
Umeå University College for Health Sciences
Värmland University College for Health Sciences
Linköping University for Health Sciences
Kalmar Län College for Health Sciences
Skaraborg College for Health Sciences
College for Health Sciences in Boden
College for Health Sciences in Borås
College for Health Sciences in Eskilstuna
College for Health Sciences in Falun
College for Health Sciences in Gävle
College for Health Sciences in Göteborg
College for Health Sciences in Halland
College for Health Sciences in Kristianstad
College for Health Sciences in Lund/Helsingborg
College for Health Sciences in Malmö
College for Health Sciences in Sundsvall/Örnsköldsvik
College for Health Sciences in Uppsala
College for Health Sciences in Vänersborg
College for Health Sciences in Västerås
College for Health Sciences in Växjö
College for Health Sciences in Örebro
College for Health Sciences in Östersund

Private-sector

Ersta Association for Diaconal Work – College of Nursing and Health
Red Cross College of Nursing and Health
Sophiahemmet College for Health Sciences

OTHER ARRANGERS OF HIGHER EDUCATION

State

Gotland College of Higher Education