Student flows within the educational system and the entering
of graduated students to the labour market

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1. The role of registers in the production of statistics

Statistics Finland, like its sister agencies in the other Nordic countries, has been working to develop the use of administrative registers for the purposes of statistics production for decades already. In Finland the earliest uses of administrative data can be traced back to census collections in the eighteenth century, while modern statistical uses began in connection with the 1970 population and housing census. After two decades of systematic expansion, the 1990 census was collected exclusively from registers, without any direct data collection from the population. At the same time as census collection methods were developed, the statistical use of administrative data sources first expanded on the side of demographic and social statistics and eventually to business statistics. Today, in keeping with the requirements of the Statistics Act, registers and administrative records are the main source of data collection for Statistics Finland.

Population censuses represent a major undertaking for every statistical authority, both financially and operationally. For this reason, statistics offices in different parts of the world are seeking new and more cost-effective ways of producing the data traditionally provided by censuses to their users. Nowadays the need for census data, and regional data in particular, is more frequent than once every ten years. Many countries have therefore started to conduct so-called interim censuses. However, in many cases even a five-year interval is not frequent enough, for instance for regional planning needs. From a budgetary perspective there is also the problem of costs peaking every five or ten years, which complicates the task of fund allocation considerably.

The above factors were the main reason why a systematic search began in Finland after the 1980 census, at the behest of the Ministry of Finance, for more economical approaches to producing census data. The obvious starting-point for a more cost-effective census approach in Finland was to use administrative data records. Finland is among the world pioneers in the statistical use of administrative data sources.

2. Register-based structural statistics, change statistics, combination statistics

Data contents of register data are also used in a variety of ways in the actual compilation of statistics. The register databases are used in so-called structural statistics, such as those describing the number and age structure of the population in different regions, the number and attributes of business enterprises or the educational level of population. These statistics are known as **structural statistics**.

Secondly, register data updates are used as a basis for compiling so-called **change statistics**. For instance, statistics on births, deaths, internal migration, marriages and divorces are based on register updates; the same applies to business start-ups and closures, and buildings and dwellings

completed. Most statistical systems are interested in both **structural data** and **change data**. There are two types of change data, i.e. **unit changes** and **attribute changes**.

The former, i.e. unit changes, include new units added to the register as well as units removed from the register, such as deceased or emigrated persons, closed-down businesses, demolished buildings, graduated students. It may also be necessary to record changes to unit attribute data, such as marital status upon marriage or divorce, an enterprise's branch of industry or staff number, the floor area or equipment of a building, the educational level of students etc. Structural data and change data are also combined to produce various **intensity figures**, such as fertility rates, mortality risks, propensities to move, etc., in different age groups.

The third type of statistics are those that are produced by **combining data from different register sources**. The linking of building and dwelling stock statistics with data on the occupants produces the housing conditions statistics, which describe the housing conditions of different household-dwelling units. The same method can be used to identify which families own a car or summer cottage, to determine the educational level or incomes of the gainfully employed population, or to describe the education and sex and age structure of a company's staff.

The fourth type of statistics is represented by so-called **flow statistics**, in which data for one and the same individual are chained together from consecutive years with a view to following statistical units over time. An example of typical flow statistics are the **placement statistics** describing transition from education to working life. Another example is how students navigate the education system towards their chosen qualification or degree. It is also important to discover what proportion of students enters the labour market without completing their qualification or degree or change their intended qualification or degree during their studies.
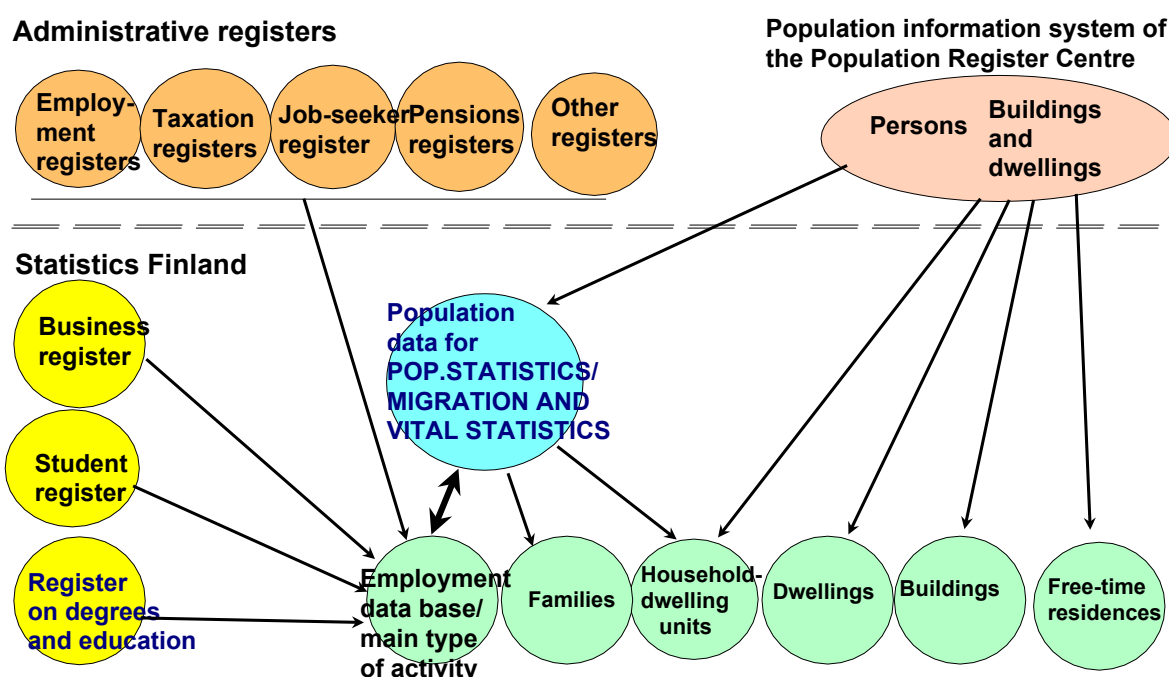

FIGURE 1. The register based system of Population Statistics in Finland

The Register of Buildings and Dwellings is used to compile the housing and building stock statistics as well as statistics on summer cottages. Statistics on housing conditions are compiled using data on housing dwellings. Statistics on housing development, the building of summer cottages, etc. are compiled on the basis of change data.

Educational data for any defined population can be obtained from the Register of Completed Education and Degrees. Register updates, i.e. data on the completion of new degrees, for their part, shed light on activities in the education sector during the past year. Completers of education and degrees are classified by level of education according to the latest/highest vocational qualification. The statistics contain data on completers of upper secondary general schools, vocational educational institutes, polytechnics and universities, as well as attainers of initial, further and specialist vocational qualifications through skills examinations. The Register of Completed Education and Degrees is based on the data on educational qualifications and degrees collected in connection with the population census of 1970. The degrees obtained during the calendar year are added to the register annually.

Student registers contain data on the students in post-comprehensive school education leading to a qualification. All post-comprehensive educational sectors (upper secondary general, vocational, polytechnic, university) are covered by these statistics with harmonised concepts and classifications. The statistics contain data by variables like age, mobility, nationality and native language of students.

The Business Register describes the existing stock of businesses as well as business activities during the past year. Change data in the register provide the basis for statistics on business start-ups and closures, changes in ownership, changes in branch of industry, etc.

The Register of Job Applicants describes the number and structure of the unemployed population at a given point in time, register updates in turn provide information on the start and ending of periods of unemployment as well as periods of labour market training and placement.

2.1. Entirely register-based statistical systems and data sets combining survey and register data

Among the administrative sources used by Statistics Finland, a distinction can be made between entirely register-based statistical systems and data sets that have been compiled or complemented by using administrative data. Examples of entirely register-based statistical systems include:
Population and vital statistics, families
Population censuses
Building and dwelling statistics
Statistics on housing conditions
Regional employment statistics
Statistics on justice and crime
Election statistics
Educational statistics
Income statistics

Examples of statistical systems that use register data for purposes of sampling and estimation and that are used as a source of additional and/or complementary information include:
Income distribution statistics
Household budget survey
Labour force survey
Wage and salary statistics
Price statistics
Business Register
Structural business statistics
Short term business statistics
Dwelling prices statistics

Statistics on accidents at work
Education statistics

3. Student flow statistics

Student flow statistics describe the flows of students from one education to another during post-comprehensive education or between education and the labour market. The development of student flow statistics began at Statistics Finland in the 1970s. The Register of Completed Education and Degrees was set up and the production of individual-based data on university students was started. Statistics were developed which examined the kinds of degrees students attained after some particular education and how long it took. In addition the duration of university studies were examined and it was discovered that upon entering the 1980s, the duration of university studies had lengthened.

When register-based employment data became available in mid-1980s, the first statistics on the transition of graduated students to working life were developed. Graduated students were monitored in a variety of ways. Statistics were produced on the employment and unemployment of graduates, their employment by industry and occupation, their income and regional transitions after having completed the education etc.

In the early 1990s, very varied data were available which could be combined to produce many new descriptions of education. In 1999, as the last stage, Statistics Finland began the annual collection of individual-based student data on all post-comprehensive education leading to a qualification or a degree from educational institutions.

In the 2000s, Statistics Finland has had at its disposal individual-based data on students in post-comprehensive education and on those with a degree or a qualification and also on the population and employment. Currently we produce annually the following student flow statistics, which are compiled by combining various register data. Separate data collections are not conducted.

Statistics on
- the prior education of new students and students
    - the area of residence of new students before studying and after attaining the degree or qualification
    - discontinuation of education
    - duration of studies
    - transition of graduates to the next level of education
    - employment of students
    - transition of graduates to the labour market after attaining a degree or qualification
    - longitudinal monitoring of transition to further studies and the labour market during several years after attaining a degree or qualification

These statistics are produced by education, region and educational institution.

Production problems associated with statistics compiled on the basis of register data. Not all foreigners have a Finnish identity number and some Finns have an incomplete one. The quality of data has, however, improved over the years partly because the Educational Administration uses the data also as the basis of performance-based funding.

Data protection in statistics compiled on the basis of register data is important. It must be guaranteed that individual persons cannot be identified. In addition, data protection must be applied in data transfers. Educational institutions deliver data from their own student administration software to Statistics Finland via an Internet operator.

In the following, some examples are given of the combined use of the Register of Students, the Register of Completed Education and Degrees and employment statistics.

In Finland the 17–29-year-olds gradually move from education to working life so that over 90 per cent of the 17 and 18-year-olds are studying, equal parts of the 22–23-year-olds are studying and working and an increasingly large part of the older persons have entered the labour market. A consistent proportion of all these young people, roughly 8 per cent, are unemployed or engaged in some other activity.
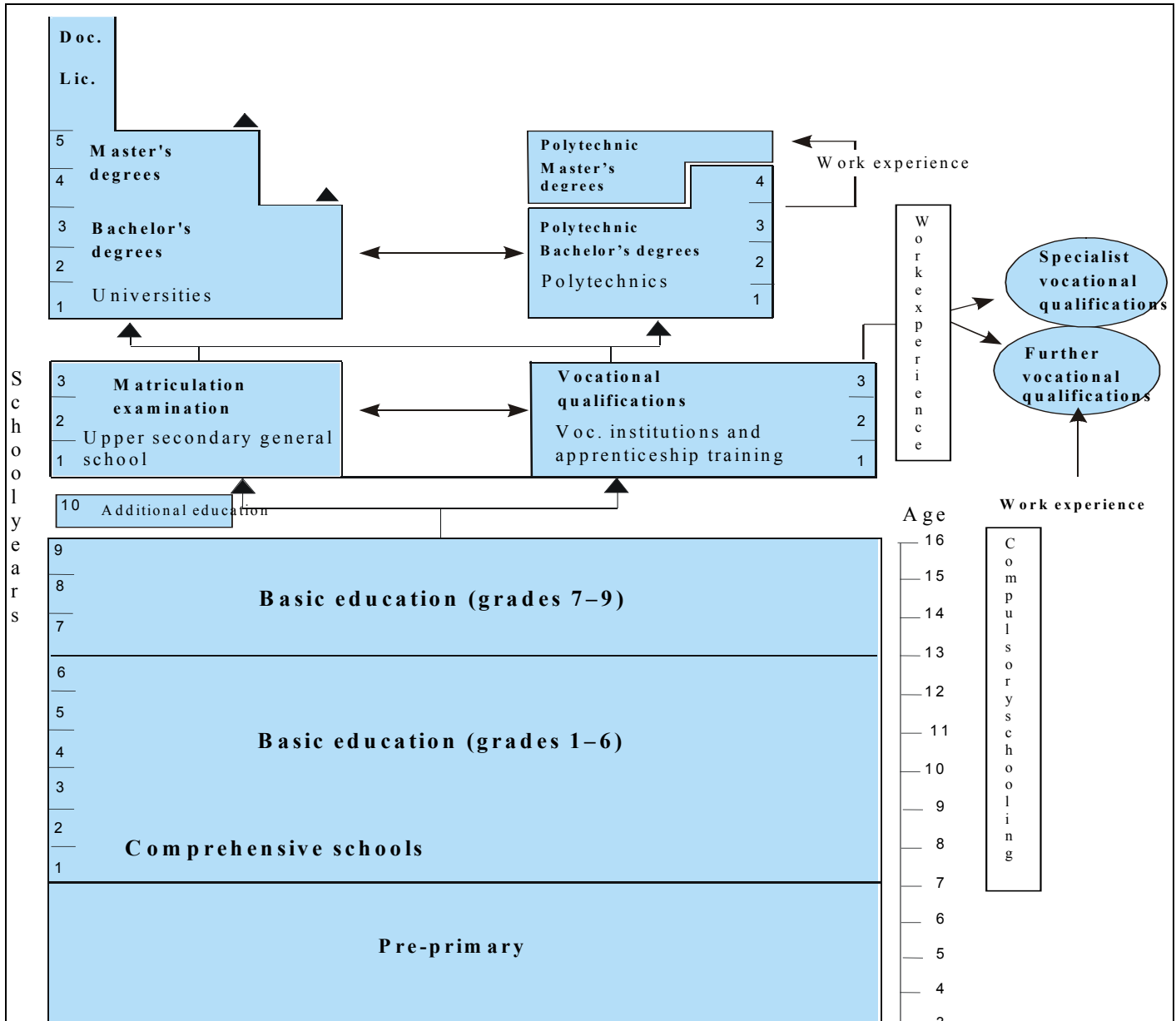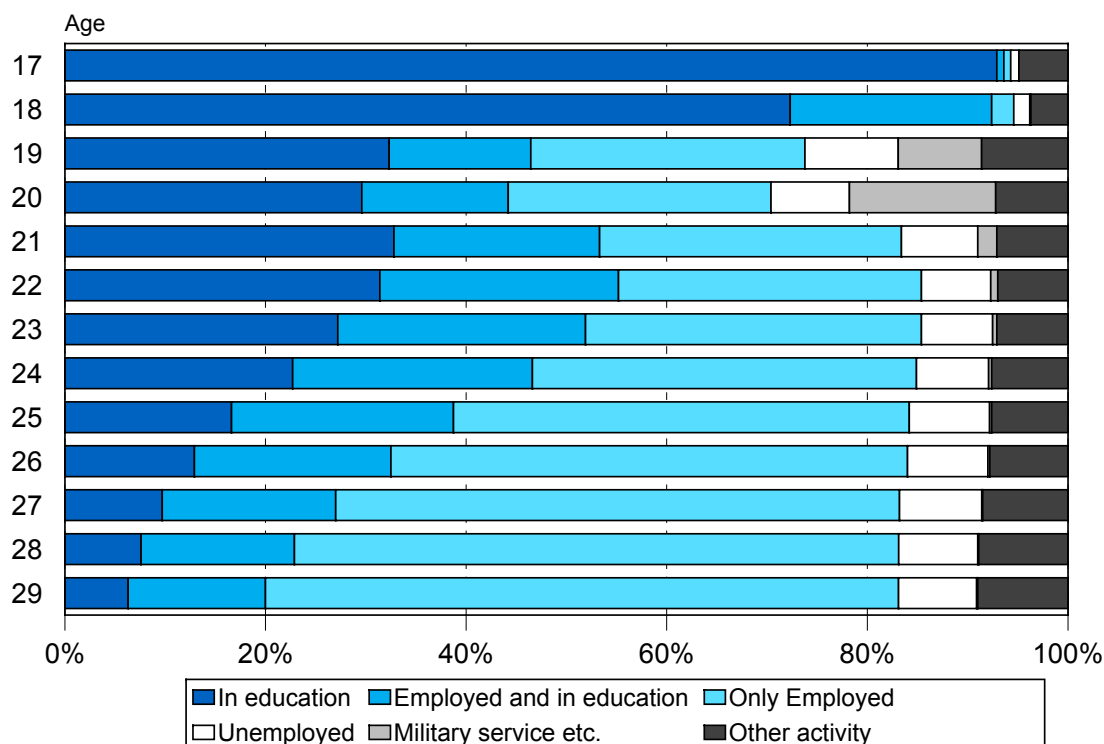

Figure 2. The regular education system in Finland

Source: Employment statistics, Statistics Finland

Figure 3. Population aged 17 to 29 by main activity at end-2005, %

The flow of the age groups between studying and working can be monitored also through the years. Over 90 per cent of people who have completed their comprehensive school education started studying that same year or in the following year. After two years, 86 per cent of them was studying, after three years the proportion of those who were studying fell to less than one-half, but it started to grow again as from the fourth year.

Year 1998	Year 1999 Studying		Year 2000 Studying		Year 2001 Studying		Year 2002 Studying		Year 2003 Studying		Year 2004 Studying	
Completed comprehensive school 66 700	Upper second.gen. education	54,1 %	Upper second.gen. education	55,4 %	Upper second.gen. education	54,8 %	Upper second.gen. education	14,6 %	Upper second.gen. education	3,1 %	Upper second.gen. education	1,7 %
	Upper second.vocat.educ	34,4 %	Upper second.vocat.educ	36,5 %	Upper second.vocat.educ	38,2 %	Upper second.vocat.edu	14,1 %	Upper second.vocat.educ.	12,1 %	Upper second.vocat.educ	11,9 %
	Vocat. coll.level	0,0 %	Vocat. coll.level	0,0 %	Vocat. coll.level	0,0 %	Vocat. coll.level	0,0 %	Vocat. coll.level	0,0 %	Vocat. coll.level	0,0 %
					Polytechnic educ.	0,2 %	Polytechnic educ.	6,5 %	Polytechnic educ.	17,4 %	Polytechnic educ.	22,4 %
					University educ.	0,0 %	University educ.	9,3 %	University educ.	14,3 %	University educ.	17,3 %
	Other education	2,2 %	Other education	0,8 %	Other education	0,8 %	Other education	2,5 %	Other education	2,7 %	Other education	2,3 %
	Other activity		*Other activity*	7,3 %	*Other activity*	13,8 %	*Other activity*	53,0 %	*Other activity*	50,3 %	*Other activity*	44,3 %
	Employed	1,7 %	Employed	2,4 %	Employed	6,1 %	Employed	25,2 %	Employed	25,9 %	Employed	28,6 %
	Unemployed	0,4 %	Unemployed	1,1 %	Unemployed	3,5 %	Unemployed	9,6 %	Unemployed	8,5 %	Unemployed	7,6 %
	Military/Civil service	0,0 %	Military service	0,1 %	Military service	0,6 %	Military service	10,0 %	Military service	8,5 %	Military service	1,3 %
	Retired	0,3 %	Retired	0,3 %	Retired	0,3 %	Retired	0,4 %	Retired	0,5 %	Retired	0,6 %
	Other activity	6,8 %	Other activity	3,3 %	Other activity	3,1 %	Other activity	7,3 %	Other activity	6,2 %	Other activity	5,3 %
	Emigrated	0,1 %	Emigrated	0,1 %	Emigrated	0,2 %	Emigrated	0,5 %	Emigrated	0,7 %	Emigrated	0,9 %
							Degree or qualification					
							Matriculation exam	42,8 %	Matriculation exam	7,9 %	Matriculation exam	0,9 % 51,6
							Upper second. vocat. qualif.	16,1 %	Upper second. vocat. qualif.	4,9 %	Upper second. vocat. qualif.	4,1 % 25,1

Figure 4. Transition of comprehensive school graduates to further education and work 1998-2004 and degrees and qualifications at the end of 1998-2004
(The priority is given to further education; if a person is studying and working/participating in other activities, a person is classified as a student)

Entering the labour market started to take place in significant numbers three years after having finished comprehensive school education. Roughly one in four people were working when three to six years had elapsed after finishing comprehensive school education. During the monitoring period, a good one-half attained a matriculation examination and a good one-fourth attained a secondary level vocational qualification.

By combining data on studying and employment, we can obtain a good picture of the participation of students in working life already during their studies. The employment of students during study semesters has been increasing steadily and e.g. over 50 per cent of university students are also working. One-fifth of upper secondary general school students and one-half of other students were employed during studies in 2004. The danger is that active employment stretches the time spent studying.
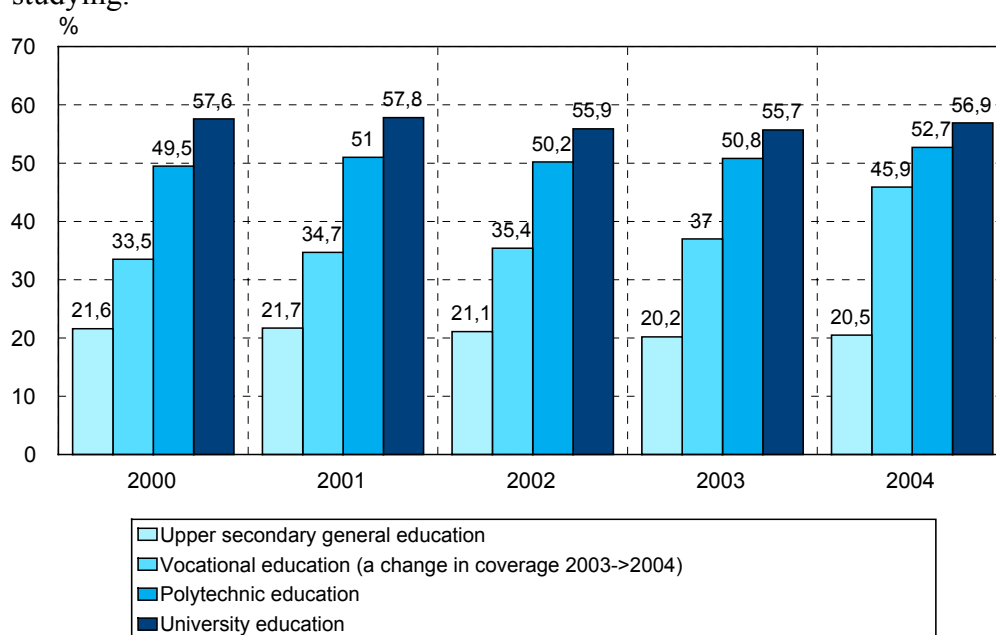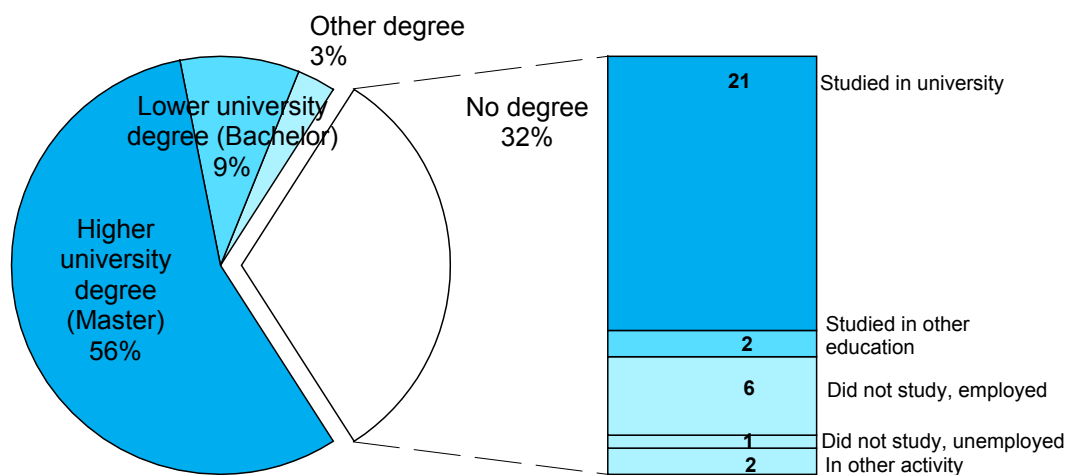

Source: Education Statistics, Employment Statistics, Statistics Finland

Figure 5. Proportion of employed students during studies by sector of education in 2000, 2001, 2002, 2003 and 2004, %

The system also produces data on how many students complete the education they start, how many discontinue an education they have started and how many change over to some other education. As all these data can be produced by educational institution, they have become a key indicator in evaluating the efficiency of educational institutions. To secure funding, educational institutions must keep the proportion of attained degrees high and the number of discontinuations low. Similarly, the successful entry to the labour market of students from an educational institution may result in additional funding for that institution.

Data on progress in studies are obtained by comparing the data on new students in a particular year with the Register of Completed Education and Degrees, the Register of Students and employment statistics by identification number and education.
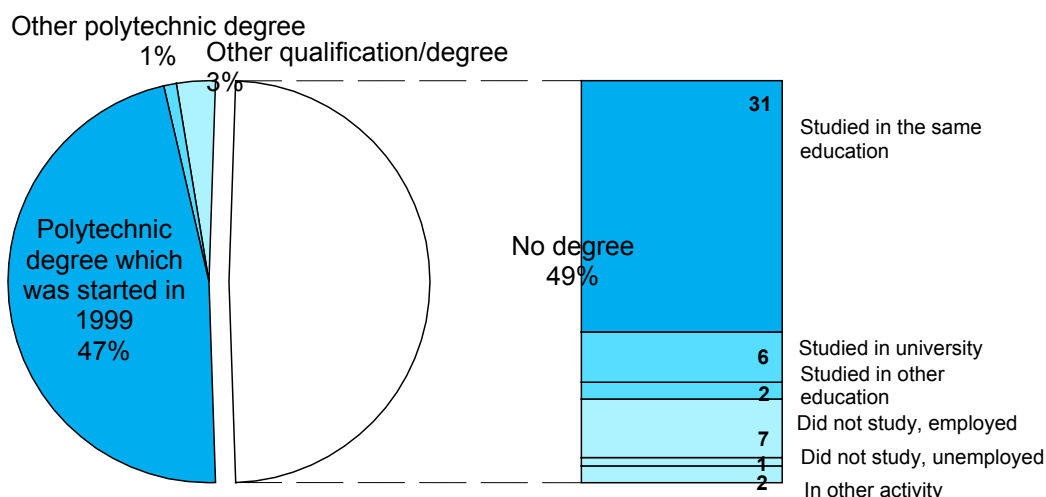
Statistics show that polytechnic education was completed in the target time, i.e. 4.5 years, by roughly one-half of the students and one-third still continued in the education they had started. Six per cent had transferred to university education and 2 per cent to other education. Slightly less than 7 per cent were employed without a degree or qualification and a good 3 per cent were unemployed or engaged in some other activity.

Other degree
3%

Lower university
degree (Bachelor)
9%

Higher
university
degree
(Master)
56%

No degree
32%

21 Studied in university

2 Studied in other education

6 Did not study, employed

1 Did not study, unemployed

2 In other activity

Source: Education Statistics, Employment Statistics, Statistics Finland

Figure 6. Progress of studies in polytechnic education of those who entered education in 1999 by end-2003, %

65 per cent had finished the university degree they had started in 8 years, one-third was still without a degree and one-fifth was continuing in the education they had started.

Other polytechnic degree
1% Other qualification/degree
3%

Polytechnic
degree which
was started in
1999
47%

No degree
49%

31 Studied in the same education

6 Studied in university

2 Studied in other education

7 Did not study, employed

1 Did not study, unemployed

2 In other activity

Source: Education Statistics, Employment Statistics, Statistics Finland

Figure 7. Progress of studies in higher university programmes (Master's degree) of those who entered education in 1995 by end-2003, %

Student flow statistics describe also the regional transitions of students. We can examine from which regions the students originate and where the graduates head to. From the above graph we can see that universities in Uusimaa educate population for their own region.

Transition statistics are used to monitor the transition of students from educational institutions to the labour market, how many of them become employed and in which fields and in which region the job is located. Educational institutions have been established to stimulate regional employment development. Therefore it is important to find out what proportion of the graduated students remains in the region to work.
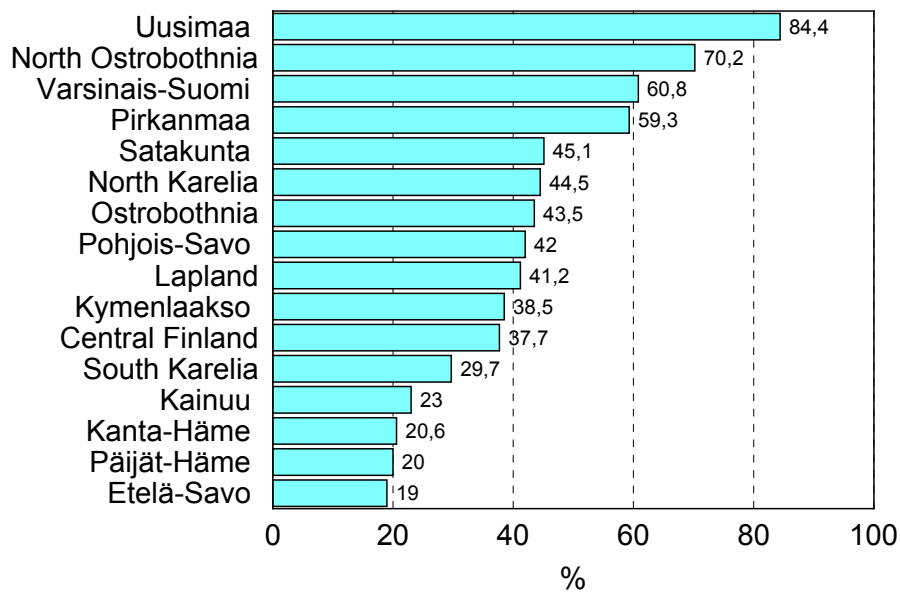
**Figure 8. The proportion of University graduates who's working area
is same as the area of graduation in 2004**

The transition of graduates to working life can be monitored right after graduation or several years after graduation. The below graph shows that the transitions to working life was the smoothest for graduates from tertiary education, over 80 per cent of them were employed within one year from graduation.
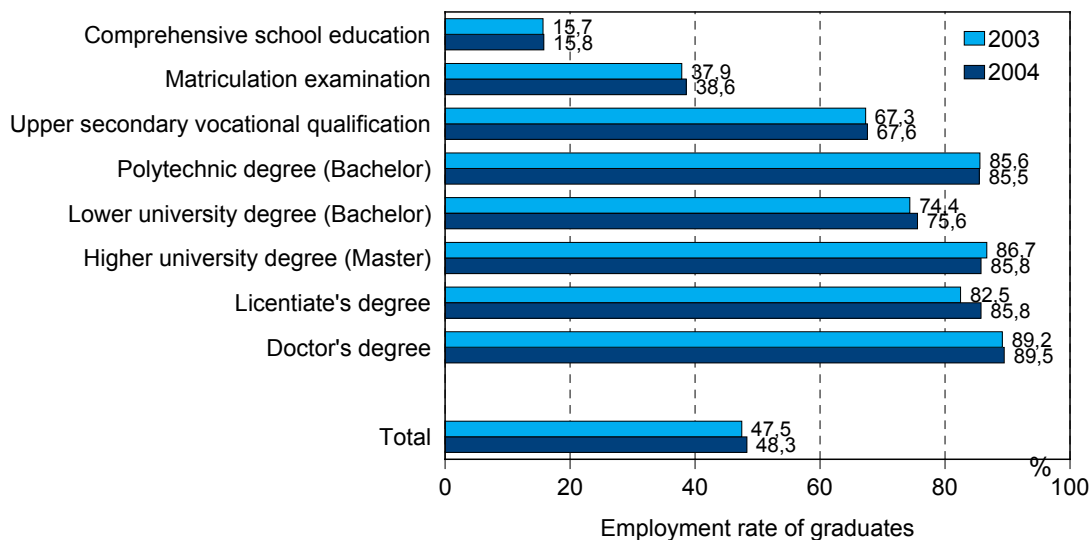
Source: Education Statistics, Employment Statistics, Statistics Finland

**Figure 9. Employment rates of graduates year after graduation
by level of education 2003 and 2004, %**

Users of education statistics Outside Statistics Finland

The most important users of all education statistivs and the tailored surveys are: Ministry of Education, National Board of Education, County Administrative Boards, Ministry of Labour, Providers of Education, Researchers /Students and other statistics. The Education Administration uses the statistics e.g. as an indicator of the effectiveness of education and as grounds for performance-based funding.

References:

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