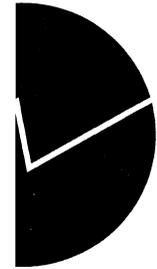


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**Longitudinal studies in education:
The Norwegian experience**

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**LONGITUDINAL STUDIES IN EDUCATION:
THE NORWEGIAN EXPERIENCE**

by Elisabetta Vassenden

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Longitudinal studies in education: the Norwegian experience

1. Weakness and strength in education statistics

Norwegian education statistics have both faithful supporters and suspicious critics. The latter maintain that these statistics take an inordinate amount of production time, and that they have a high cost. But Norwegian education statistics *do not* have a longer production time than countries with a similar system. Moreover, to coordinate more than one thousand different sources in a complex statistical system *is* rather costly. And last but not least, the education system is changing all the time, so to keep up with it is no small job.

A complex and heavy-to-manage data system offers though some important bonuses:

- a. It is an individual-based system, where each pupil/student is identified by a unique National Identification Number.
- b. Even though some actual bounds exist, excluding the shortest courses, this is a *total* system for Norway, comprising every individual with an education in progress at 1 October, and every individual completing an education in the course of the school year (1 October to 30 September).

Norwegian education statistics do not stop at merely 'counting heads'. Aggregated data would have been enough for that, and a complicated individual-based system wouldn't be necessary. Individual data with a National Identification Number give much more scope for further development. The limits of the possible development are set by confidentiality, by the laws regulating data protection, by the available budget and by the statistician's own imagination.

2. Users' needs

Among Statistics Norway's most important users are governmental authorities, local administrations, research institutes and the media. In the last few years all these agencies have experienced an increasing need for longitudinal data to follow up special groups of population and measure their degree of integration/social exclusion. Examples of such groups are young people, immigrants, people living in a special area/municipality, or a combination of those (e.g. young immigrants or the youth residing in a given municipality).

Longitudinal studies can also be of great help to monitor the social effect of structural reforms, for example in the education system.

3. Our solution

The structure of our data gives us the chance to build up a system with the National Identification Number as the linking key between several registers. The population in the system comprises a cohort that completed one type of education. Each individual is followed up during 15 years, and information on education in progress and education completed during this period is assembled together (figure 1). The biggest difference between Statistics Norway's solution and most longitudinal studies, both in Norway and in other countries, is that this is not a *survey* but a *total overview* of a cohort.

Up to now we have followed up two types of cohorts (but the data structure allows to follow up almost any other group of pupils):

1. the compulsory education cohort, that completed lower secondary education in a given school year, and
2. the secondary education cohort, that completed upper secondary education in a given school year.

Each compulsory education cohort contains about 60000 individuals, while each secondary education cohort comprises slightly more than 50000. Up to now the system was organized as traditional sequential files in a mainframe environment, but it will shortly be moved to another platform as SAS files.

In addition to the central information about the person's participation in the education system, other important background variables are collected and linked, e.g. municipality of residence, country of birth, immigrant type (including second-generation immigrants), reason of entry, social background and the parents' level of education.

4. Good planning is essential

It is a well-known fact that it's not easy to work with longitudinal data. Many a statistician has collected and gloatingly put together a huge amount of information, only to discover far too late that too much information can be unmanageable. The main requirement when working with this kind of data is to give them a good, strategic structure.

The best data structure is not achieved by linking registers indiscriminately, thinking only of the *linkage* process. The best structure is achieved by thinking of the *use* of the longitudinal data. Analysis and presentation should provide the guidelines for linkage and subsequent data structure.

An essential element to reach the optimal structure (if there is one) is to have close cooperation between statistician and system designer.

After sweating over a simple cohort file and simple tables requiring extremely advanced programming skills, it became apparent that we had to give the system a complete overhaul, followed by a thorough face-lift. This moved the focus of the file from the raw longitudinal data to a number of new secondary variables, summarising and developing the events portrayed in the longitudinal part. Examples of such variables are the level of education achieved during the observation period, school year when this was achieved, age at achievement, number of foundation courses in upper secondary education, number of years in upper secondary education and number of years in apprenticeship.

Secondary (but strategic) variables

Level of education achieved
School year of achievement
Age at achievement

Number of foundation courses in upper secondary education
Number of years in upper secondary education
Number of years in general upper secondary education
Number of years in apprenticeship
Movements in upper secondary education
Type of irregular movement
School year for irregular movement
Completion of 12th class level

Number of years in higher education
Number of years at universities
Number of years at colleges
Completion of BA
Completion of MA

With the help of these secondary variables, no programming skills are required to obtain good overview tables. A lot of information has already been processed and stored in the new variables, and the data presentation and analysis are more easily tackled. The most important phase in the construction of the system is no longer the *assemblage* of the material but its *development*.

5. A quantitative approach

The information contained in the cohort files is purely quantitative. Since the files are totally register-based, they lack the qualitative approach that is usually not to be found in registers.

The material allows to bring into focus the youth's choices and movements in the education system, and the effectiveness/structural disfunctions to be found within the same system. Although it is possible to point out some factors that may have influenced the youth's choices or caused the system disfunctions, any questions looking for the actual motives behind the choices must be answered by special sample surveys.

This is what often happens in the cooperation between Statistics Norway and various research institutes: the statistical agent offers the total quantitative overview of the situation, allowing to point out some definite problem areas. These are further looked into and analysed by the research institute using a sample survey with a more qualitative approach.

6. Some results

The first choice of the youth completing compulsory education seems to be very important for their future school career: more and more young people will start upper secondary education choosing a subject that gives access to universities and colleges, i.e. either a general or a commercial subject. About 47 per cent of the 1980 compulsory education cohort chose one of these two subjects, while 59 per cent of the 1991 cohort did the same. But the biggest change during the eighties was in the percentage of the youth outside the education system after completing lower secondary school: in 1980 almost 19 per cent, but less than 5 per cent in 1991. This mirrors a difficult labour market in general, but especially for young people and unskilled workers (Vassenden, 1993).

Social background influences the youth's choices. Six out of ten children from families with a high level of education chose general subjects in 1980. Only two out of ten from families of unskilled workers and fishermen took the same decision (Severeide, 1989).

Girls and boys choose different courses for their education. Girls have been overrepresented in subjects that give access to universities and colleges all through the eighties. As much as 70 per cent of the girls in the 1991 cohort registered at subjects preparing for higher education. Moreover, girls are decidedly in the majority in health education (almost 100 per cent!) and home crafts and aesthetic subjects. On the other hand, nine out of ten pupils studying craft and industry are boys.

6.1. Wandering through upper secondary education

A normal progression through upper secondary education means attending a foundation course, and two advanced courses, all in all three years. But reality is quite different for the majority of the pupils: most of them are in upper secondary education either for *more* or for *less* than three years. There are not enough advanced courses for all the youth that have completed a foundation course. Since competition is very strong, many young people are compelled to take the long way round to reach their goal, taking foundation course upon foundation course to be given a higher priority in the next entrance round where they will stand a better chance of securing a place in the course of their choice.

Therefore it is a minority that manages to complete upper secondary school in normal time: after *five* years only about 50 per cent of the 1980 cohort and 55 per cent of the 1985 cohort. The youth that chose general subjects right after compulsory education have a higher completion rate, respectively 88 and 86 per cent. The situation is not so favourable for the pupils that chose craft and industry: in the 1980 cohort only 3 out of 10 managed to complete after five years, in the 1985 cohort 4 out of 10 (figure 2). These differences are also due to the fact that general subjects are offered as a three-year course, where the difficulty is in getting enrolled the first year. On the other hand, to complete a vocational subject it is necessary to enrol in (and complete) three different courses.

The most difficult subjects to complete are also the subjects where the youth are likely to wander through upper secondary education, up and down, here and there, without really acquiring a completed curriculum. The percentage of wanderers is lowest in general subjects, where the completion rate is highest. On the contrary there are more than 40 per cent wanderers in craft and industry (figure 3).

6.2. Big differences among young immigrants

Immigrants in Norway (here: people born abroad) are a very heterogeneous group, comprising a variety of languages, cultures and origins. People coming from different parts of the world show a different behaviour in the education system, and sometimes there are big differences even among people from the same part of the world.

Among all immigrants, young people from Europe and North America have the highest completion percentages and they proceed most directly to higher education both in the 1980 and the 1985 cohort. The youth from developing countries show contrasting tendencies: some are strongly influenced by a high age at migration and do not manage to fully exploit the possibilities of the education system, others on the contrary are as effective as Norwegian pupils.

7. How we changed the course of upper secondary education.....

The public understood the usefulness of longitudinal studies in education already at the beginning of the cohort file project. The first results, presented in *Sosialt utsyn 1989* (Social Survey 1989), showed an inefficient upper secondary education system, with pupils attending foundation course upon foundation course without a real chance to progress (Severeide, 1989).

It hadn't really helped the system that the variety and number of foundation courses had been widened during the eighties to make room for all the youth that wished to study, because the lack of proportion between foundation and advanced courses was still much too strong.

The education system had been getting more and more incredibly crowded at the end of the eighties also because the increasing unemployment forced more and more of the youth to proceed with their studies after compulsory education. With a different labour market situation, many of these young people would have chosen to work instead of studying.

Of course governmental authorities had realised that there had to be structural problems in upper secondary education, nevertheless it was a great help to ascertain that as much as 40 per cent of the youth took two or more foundation courses. Only 25 per cent went right through upper secondary education in normal time.

After two reports from the Confederation of Norwegian Business and Industry, based on data from Statistics Norway (*Kunnskapens pris*, 1990, and *Underveis*, 1991), an official committee was appointed to examine the situation in upper secondary education. The result was a Norwegian Official Report (NOU 1991:4, *Veien videre til studie- og yrkeskompetanse for alle*) with the proposal of a radical reform in upper secondary education, called Reform '94.

7.1. Reform '94

The plans for Reform '94 were finalised with remarkable speed, and upper secondary education got a whole new structure starting from August 1994.

The most important feature of the reform is that all 16- to 19-year-olds are given the right to three full years of secondary education: the regional authorities are obliged to fulfill this clause (*Reform '94: This is our solution*, 1994). Moreover, the foundation courses are reduced from 109 to only 13 and all pupils have the right to be admitted to one of their top three choices on entering upper secondary education. As pupils and apprentices move up in the system, they branch off into more and more specialised choices. At the end of their training, pupils either have a diploma qualifying for college and university education, or a certificate as a skilled worker. A special follow-up service is established to take care of eventual drop-outs.

Statistics Norway is using the compulsory education cohort files to help the Ministry of Education and the Institute for Studies in Research and Higher Education to assess the effects of Reform '94 by comparing the pupil flows before and after the reform. The big question is whether the structural changes have modified the pupil flows according to the reformers' expectations. This will be ascertained in a few years' time.

8. Possible developments

To get a more accurate picture of the youth's flow in and out of the education system, and to measure their degree of social exclusion in a more complete fashion, it would be necessary to widen the project to labour market statistics. Provided the Data Inspectorate gave their blessing to the linkage, it would be technically feasible in a future implementation of the system to link the cohorts to labour market registers. This would put the focus on the flows between school and occupation.

The development would offer new and interesting possibilities. However, the amount of work caused by a new linkage of two different sources from different statistical fields should never be underestimated. This kind of linkage usually encounters unforeseen technical and statistical problems, and of course it would require a whole new set of systematic variables to classify the new alternatives in the cohort flows, taking account of the new relationships between education and labour market.

9. Future goals

To secure a regular use of the cohort files, and completely explore the wealth of information they contain, they should have status as regular statistics. This would give them a higher priority and a regular dissemination *at all times*, not only occasionally in connection with articles for some special publication.

The contacts with research institutes should increase to include a broader choice of Norwegian and foreign researcher. At the same time, the contacts with the general unlearned public and a wider dissemination should not be forgotten: even though the material in the cohort files sometimes can be complicated and not so easy to grasp, it should be an important goal to make it available to the general public, presenting it in an especially popular form to reach as many as possible.

10. References

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Figure 1. Example: modules in the 1980 compulsory education cohort file

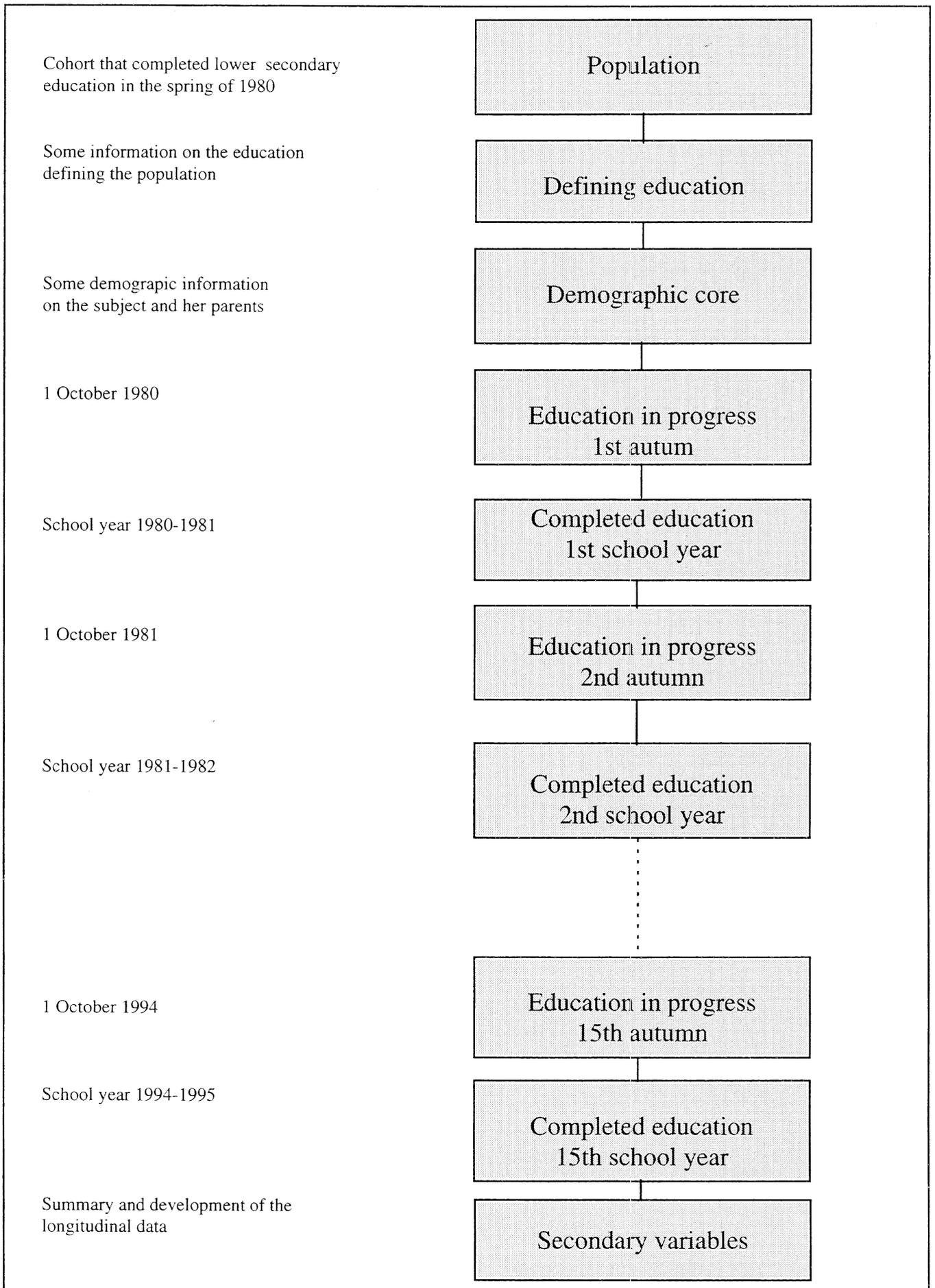
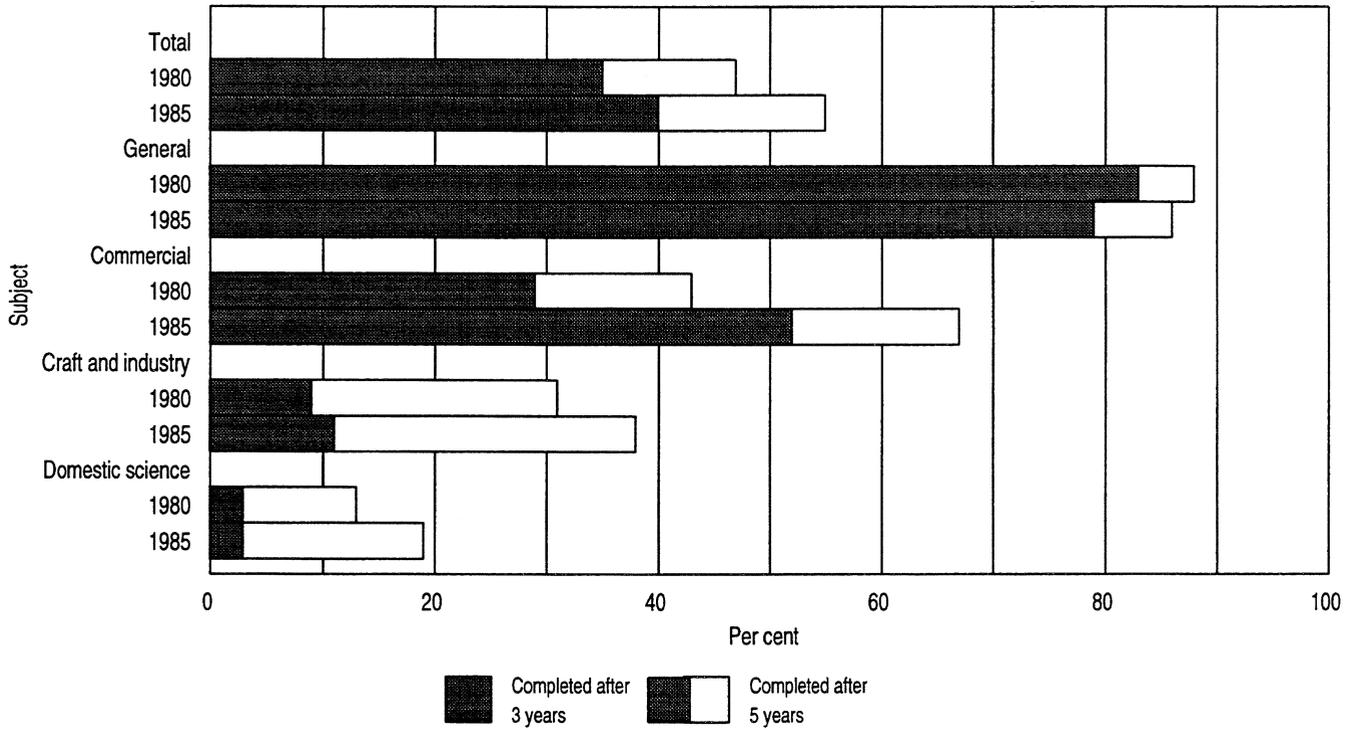


Figure 2.

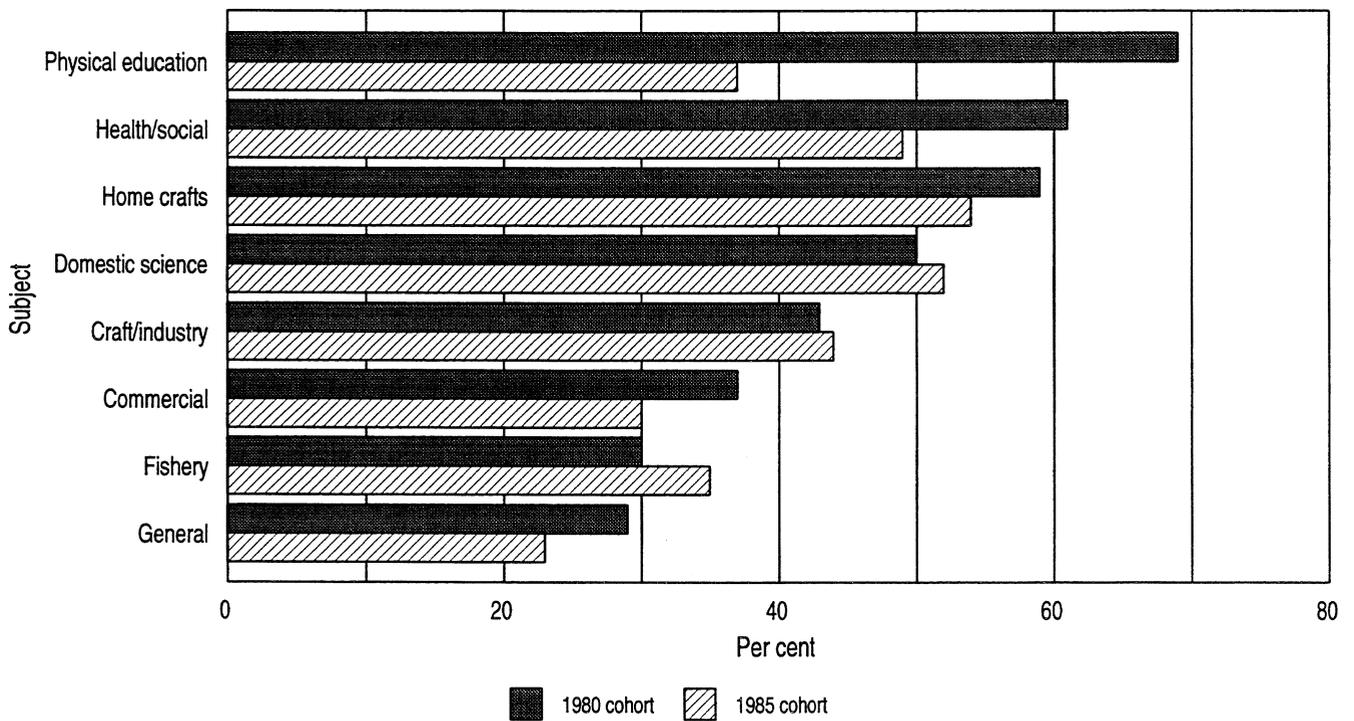
Percentage of pupils that completed upper secondary education three and five years after completing compulsory education. 1980 and 1985 cohort



Source: Vassenden 1993

Figure 3.

Percentage of pupils that wander in upper secondary education according to the first chosen subject. 1980 and 1985 cohort



Source: Vassenden 1993

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