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AUTHOR Friberg, Nils; And Others
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ABSTRACT

In Sweden, technical and vocational education is totally integrated into the national school system and cannot be taken out and examined completely on its own. Internationalization, the revolution in information and communications systems, and rapid and sometimes stunning technological change have influenced all groups, levels, and aspects of Swedish society. These three major factors are very important in the reasoning behind the creation and implementation of a successful education system, of which technical and vocational education is a fundamental element. Today, Swedish education is in a state of transition. A major reform, the Upper Secondary School Reform 1992, has had an impact on all aspects of technical and vocational education. One of the essential ambitions of the reform is the implementation of the concept of "lifelong learning." Four groups are given particular support to improve their participation in national education: females, immigrants, mentally handicapped individuals, and physically handicapped. The Swedish education system is supported by government subsidies and municipal funding. Entrepreneurial orientation in technical and vocational education is much better emphasized under the Reform. Several private industries have taken their own initiative and set up different forms of cooperation with the upper secondary schools to ensure relevant technical and vocational education. (Appendixes contain 19 references, fact sheets on 16 national programs, and vehicle program specification.) (YLB)

The Role of Technical and Vocational Education in the Swedish Education System

The International Project on Technical and Vocational Education (UNEVOC) is a project of the United Nations Educational, Scientific and Cultural Organization (UNESCO). Its purpose is to contribute to the development and improvement of technical and vocational education in Member States.

UNEVOC works in *three programme areas*

Programme Area A deals with the international exchange of experience and the promotion of studies on policy issues. It is devoted to *system development* in technical and vocational education.

Programme Area B is devoted to strengthening national research and development capabilities, that is to the development of *infrastructures*.

Programme Area C concerns access to data bases and documentation in its broadest sense, in other words, with *information and communication*.

The basic concept behind *Programme Area A* is to *enhance the role and status of technical and vocational education* within national education systems.

UNESCO held a consultation in 1993 with experts from different regions of the world in order to identify some of the factors which determine *role and status of technical and vocational education*. Based on the findings, a series of case studies has been initiated on the relevance of these factors within given national education systems.

The present study on " The Role of Technical and Vocational Education in the Swedish Education System" has been prepared in this context.

This study was prepared by Nils FRIBERG (Executive Director), Björn CARNSTAM (International Coordinator) and Louise HENRY (Assistant) of THE EDUCATION CENTRE OF KRISTIANSTAD, Sweden, in 1994.

This version is being prepared for publication at the
UNEVOC Implementation Unit • Fehrbelliner Platz 3 • 10707 Berlin • Germany • Fax [+49 30) 86 49 15 41
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Summary

In Sweden, technical and vocational education is totally integrated into the national school system and as such cannot be taken out and examined completely on its own. Labour market policy and education policy often go hand in hand but must not be seen as interchangeable. Technical and vocational education has the complex task of combining flexibility to solve difficult problems of different levels of urgency, at worst in a labour market changing month-by-month, as well as being an integral part of the country's education policy that must have long-range vision and strategies for maintaining and improving a country's wealth. Here, the term wealth refers to something much more than simply the concept of what can be measured in terms of material possessions.

Internationalization, the revolution in information and communications systems, and rapid and sometimes stunning technological change have influenced all groups, levels and aspects of Swedish society. Consequently, these three major factors are of the utmost importance in the reasoning behind the creation and implementation of a successful educational system, of which technical and vocational education is a fundamental element. At the beginning of the 90s, Sweden's position was weakened since its labour force was not as well educated as that of other industrial nations in the West.

Today, in 1994, Swedish education and especially technical and vocational education, is in a state of transition. A major reform was initiated in 1992, the Upper Secondary School Reform 1992. By the school year 1995/96, students will be admitted only to the new national programmes as specified by this reform. The effects of this reform are far-reaching in that the Reform impacts all aspects of technical and vocational education and general/ theoretical education in youth upper secondary education and in municipal adult education as well as some important aspects of university education and application requirements. The Reform also stipulates a new system of marks and a new curriculum, in effect beginning with the autumn 1994 term. The Upper Secondary School Reform 1992 is the most extensive of this century in Sweden. It has been worked out in order to guarantee the individual's right to freedom of choice as well as to meet society's demand for a school that can adapt to rapidly changing external conditions in the near society and in the global society.

One of the essential ambitions of the Reform is the implementation of the concept of ***lifelong learning***. Education must give people the necessary competence and self-confidence, providing the individual with the foundations to see change not as a threat but as a potential opportunity. Multi-facetted knowledge is necessary especially in times of dramatic and profound changes. The speed and extent of developments in traditional technology and information/communication technology today make knowledge a kind of perishable goods, that must be constantly renewed and kept fresh. This means that education, be it theoretical or vocational, must not be seen as a finite product, but as a life-long process of learning. *In this respect, formal education must not only provide the student with certain skills and knowledge but also the* ***key tools*** *for renewing skills and supplementing knowledge throughout an entire lifetime.*

The main strategies of the Upper Secondary School Reform 1992 are:

1. *decentralizing education authority and decision-making power*
2. *increasing local freedom in the allocation of funds for education*
3. *realizing a smoother transition from youth upper secondary education to municipal adult education*
4. *creating a more course-oriented upper secondary education structure*
5. *raising the status of technical and vocational education to the same level as general/ theoretical upper secondary education*

Traditionally and also under this Reform, four groups are given particular support in order to improve their participation in national education, especially also the opportunities offered by technical and vocational education: Girls, immigrants, the mentally handicapped and the physically handicapped.

Concerning the financing of technical and vocational education, the Swedish education system is supported by government subsidies and municipal funding. Costs are not broken down into areas such as technical and vocational education or general/theoretical studies. The total expenses for

the upper secondary school were approximately 17.4 thousand million SEK in 1992, of which half may be expected to have been used for technical and vocational education. In 1992, expenses for municipal adult education were approximately 2.5 thousand million SEK, of which only a minor part may be expected to have been used for technical and vocational education.

Entrepreneurial orientation in technical and vocational education is much better emphasized under the Reform. The study of basic business economics is now included in fifteen of the sixteen national programmes. In addition, the study of Business Economics for Small Businesses is offered in eight national programmes. During the past years of recession and privatisation, there has been more support for a broader small business sector in Swedish society. A form of "vocational" education available now to adult students is seeen in the "Starting Your Own Business". This, combined with the raised status of vocational education, is expected to lead to an increase in the number and status of small businesses in Swedish society.

Several private industries have taken their own initiative and set up different forms of cooperation with the upper secondary schools in order to ensure relevant technical and vocational education. These initiatives also include efforts to de-dramatize technology in the elementary school in order to encourage elementary school pupils to study technical and vocational education programmes in the future.

Regarding teacher training and supplementary teacher training, the Reform stipulates that, in addition to the specific knowledge and skills relevant to the subject taught, the teacher's responsibility includes other non-traditional teaching responsibilities. These responsibilities are meant to promote an atmosphere of democracy and personal responsibility in the classroom. The new responsibilities, in their orientation and gravity, lead to a serious need for supplementary training for teachers. This need is also based on the increased demands on the professional knowledge each teacher possesses, knowledge that must be constantly updated in order to stay in touch with both local and global events that have an impact on the subject taught. The need to cooperate with other teachers applies especially to teachers in technical and vocational education who must coordinate their students' education in the school with training at different commercial/ industrial companies, due to the requirement that 15% of vocational studies must be carried out at a relevant workplace. The format and content of supplementary training for teachers may be asserted as one of the most important questions in education today, for teachers of both general/ theoretical subjects and vocationally oriented subjects.

This case study is thus a report on an educational system in transition, due to the introduction of the most important school reform in Sweden in this century. Students of technical and vocational education are expected to benefit greatly from the Reform, as it is oriented towards raising the status of technical and vocational education. It is also oriented towards the maintenance of a democratic society in which all members of society have access to educational opportunities that promote ***life-long learning***.

1 Introduction and Brief History of Technical and Vocational Education

In Sweden, technical and vocational education is totally integrated into the national school system and as such cannot be taken out and examined completely on its own. Labour market policy and education policy often go hand in hand but must not be seen as interchangeable. Technical and vocational education has the complex task of combining flexibility to solve difficult problems at different levels of urgency, and worst of all, in a labour market changing month-by-month, as well as being an integral part of the country's education policy that must have long-range vision and strategies for maintaining and improving a country's wealth. Here, the term wealth refers to something much more than simply the concept of what can be measured in terms of material possessions.

100 years ago, Sweden was one of Europe's poorest agricultural countries, struggling with the problems facing a society based on class differences, poverty, little educational opportunity except for the privileged, and extensive emigration. Apprenticeship training was always entirely located in, and the responsibility of the workplace. Any theoretical studies were carried out in evening classes, to the extent that these were available.

75 years ago, in the recession after the First World War, industry renounced this expensive responsibility of taking on apprentices and the school system took over much of the practical training in daytime classes. This lead to municipal responsibility for education in industry and trade.

50 years ago, Sweden was on the verge of erasing many class differences, emigration had been stemmed and educational opportunity had definitely reached into the sphere of vocational educational opportunity. After the Second World War, labour market education became a new factor in the education system and a matter of concern for the national school system. Thus, the national school system accepted the civic responsibility for traditional education, vocational education, apprenticeship training and training for unemployed persons. Vocational education was based on specific manual skills with little consideration of learning to solve problems, make choices or take the initiative. Students waited until a relatively late age to make vocational choices; however, this must be seen against the background of depression that made vocational choices almost a matter of survival. The Second World War also affected vocational choices, especially for women who, after training and some years' professional experience, were often forced into the ranks of the unemployed when the war was over.

25 years ago, in the expanding economy of the 70s, university studies were a realistic goal for many students whose parents had never dreamed of this. The Upper Secondary School Reform of 1971, based on the 1970 Curriculum for the Upper Secondary Schools (known in Swedish as Lgy 70) united the existing schools for voluntary education (university preparatory upper secondary school, vocational school and technical school) into one upper secondary school with one administration. However, technical and vocational education, though officially integrated, widely available, covering many vocational fields and providing skills in Swedish and English, was still limited in its vision of preparing these technical/vocational students for specialist areas only. At this time only a few unusual professions maintained responsibility for apprenticeship training. The reform work of the 60s, that envisioned a more generally oriented technical and vocational education, was mostly ignored; and machining techniques came to dominate the training in industrial education courses (e.g. workshop, electrical/telephone, and vehicle technology courses). Education was chiefly taylored according to the estimated labour market needs. Interesting to note here are some of the training goals as stated in the official report *SOU 1966:3* - almost 30 years ago:

1. cooperate with others at the workplace
2. plan the work rationally
3. make decisions regarding different action plan alternatives

These appear also in updated form in the reform now in progress in the 1990s.

Over the last 10 years, vocational education on-site in industry has lost even more ground to practical training in the schools, while at the same time vocational education has had to respond to dramatic changes in the organization of the labour market, demands for more highly qualified personnel and the need for much closer ties with

industry; in order to guarantee the continued development of Sweden as an industrial nation. During the last ten years, young people have been hesitant to apply to the vocational education programmes in the technical and industrial sectors. This is partly due to poor general knowledge among youths of what it's like to work in a modern industry and also due to poor interaction between industry, the schools and general society. Another factor here is the appearance of groups in the labour market that traditional vocational education has not been able to cope with, i.e. first and second generation immigrant children and the handicapped.

This brief history is superficial at best, but ***three important aspects*** emerge:

1. Technical and vocational education has been definitely acknowledged as an integral part of the education system, in youth schools and adult schools.

2. Changes in technical and vocational education have been based on

   a) assuring Sweden's place as an industrial nation and

   b) the extent of unemployment in general and youth unemployment in particular.

   Teaching materials have not been able to respond to the officially stated goals and intent of technical and vocational education.

3. In the past, recessions have led to narrower horizons for technical and vocational education, with training based on more specific vocational skills, and the expectation or existence of a good economy has led to broader horizons and more general goals for technical and vocational education in order to facilitate geographical movement and vocational freedom.

The national curriculum reforms since 1960

1962 *Lgr 62 - Läroplan för grundskolan 1962*: 1962 Curriculum for the Compulsory Schools

1970 *Lgy 70 - Läroplan för gymnasiet 1970*: 1970 Curriculum for the Upper Secondary Schools

1980 *Lgr 80 - Läroplan för grundskolan 1980*: 1980 Curriculum for the Compulsory Schools

1994 *Lpf 1994 - Läroplan för friviliga skolformer 1994*. The term "non-compulsory schools" refers to all forms of schooling beyond the mandatory 9-year secondary schooling in Sweden, i.e. upper secondary, post-upper secondary, etc.

2 Present Situation - Period of Transition

Internationalization, the revolution in information and communications systems, and rapid and sometimes stunning technological change have influenced all groups, levels and aspects of Swedish society. Consequently, these three major factors are of the utmost importance in the reasoning behind the creation and implementation of a successful educational system - of which technical and vocational education is a fundamental element - a system that is vital to maintaining and increasing the standard of living of the entire society. At the beginning of the 90s, Sweden's position was weakened because its labour force was not as well educated as that of other industrial nations in the West.

In the 90s, historical trends seem to have a reverse application - the facilitation of geographical movement and vocational freedom is now seen as a means *to ameliorate* today's very serious labour market situation in which very few make predictions about the future, and many unemployed and especially youth unemployed have bleak prospects of finding a job. At the same time, industry and trade are looking for persons who have considerably more talent than pure technical/ vocational skills; instead promoting and rewarding those with traditionally humanistic skills, e.g. in foreign languages, communication, economy, and general computer science. The present situation has been considered to be partly due to the failure of central planning.

Today, in 1994, Swedish education and especially technical and vocational education, is in a state of transition. A major reform was initiated in 1992, the Upper Secondary School Reform 1992. By the school year 1995/96, students will be admitted only to the new national programmes as specified

by this reform. The effects of this reform are far-reaching in that the Reform impacts all aspects of technical and vocational education and general/ theoretical education in youth upper secondary education and in municipal adult education as well as some important aspects of university application requirements and education. The Reform also stipulates a new system of marks and a new curriculum, in effect from the autumn 1994 term. The Upper Secondary School Reform 1992 is the most extensive of this century. It has been worked out in order to guarantee the individual's right to freedom of choice as well as to meet society's demand for a school that can adapt to rapidly changing external conditions in the near society and in the global society.

One of the essential ambitions of the Reform is the implementation of the concept of ***lifelong learning***. Education must give people the necessary competence and self-confidence, providing the individual with the foundations *to see change not as a threat but as a potential opportunity.* Multi-faceted knowledge is necessary especially in the face of dramatic and profound changes. The speed and extent of developments in traditional technology and information/communication technology going on today, make knowledge a kind of perishable goods, that must be constantly renewed and kept fresh. This means that education, be it theoretical or vocational, must not be seen as a finite product, but as a life-long process of learning. *In this respect, formal education must not only provide the student with certain skills and knowledge but also the* ***key tools*** *for renewing skills and supplementing knowledge throughout an entire lifetime.*

The main strategies of the Upper Secondary School Reform 1992 are:

1) Decentralizing education authority and decision-making power

This has been effected by dissolving the National Board of Education and the 24 county education committees as well as the Swedish Institute for Teaching Materials. Instead, Sweden now has the National Agency for Education responsible for the three main tasks of assessment, follow-up, and supervision.

A great amount of authority has thus been placed in the hands of local boards with extensive decision-making responsibility for the municipalities and in the hands of the schools themselves.

2) Increasing local freedom in the allocation of funds for education

(See Section "Financial Resources and Financing", page 13.)

3) Realizing a smoother transition from youth upper secondary education to municipal adult education

In the Reform, the same curriculum will apply to both upper secondary education and municipal adult education. This means a structural integration of the two types of education, and that the artificial division of studies into "years" will be replaced by a course-oriented structure of studies within the framework of the national programmes. (See also point 4 immediate following for further discussion.)

4) Creating a more course-oriented upper secondary education structure

The intent of the Reform is "course-oriented" upper secondary education within the framework of the national programmes, which means that after the Reform has been completely implemented, each and every student will have the chance to compose his/her "own" programme, although most students are expected to follow the national programmes as they have been set up today. *The course-oriented structure means improvement in several aspects of especial importance to students in technical and vocational education:*

a) Easier to combine general/theoretical subjects with vocational subjects
b) Greater opportunities for each individual student to direct his/her own studies based on his/her own needs and desires

c) Greater opportunities for each municipality to influence the education offered in the region.

d) Students can complete their studies in a shorter or longer period than the normal three years. Each student enters at his/her own level of knowledge and exits after achieving his/her goals.

e) The syllabus for each course includes a clear description of the knowledge and skills the student is to achieve

5) Raising the status of vocational education to the same level as general/theoretical upper secondary education

Strategies to raise the status of technical and vocational education are:

a) More closely integrating vocational education into the normal upper secondary school and increasing the extent of compulsory general subjects - "core subjects" - for students in vocational education
b) Making all education programmes, including the vocational programmes, three years in length
c) Introducing a new form of "workplace-related" education
d) Revising the assessment of qualifications

These are described more fully in the following discussion:

a) More closely integrating vocational education into the regular upper secondary school and increasing the extent of compulsory general subjects - "core subjects" - for students in vocational education.

Now all students in programmes of technical and vocational education study the following core subjects in common with those students aiming for university entrance: Swedish, English, Mathematics, Civics, Religion, Sports & Health, Arts Activities and General Science. (Note: In mu-

Vocational programmes and branches

Arts Programme
- Art and design
- Dance and theatre
- Music

Building and Construction Programme
- Construction metals
- Building
- House Painting

Business and Administration Programme

Children and Recreation Programme

Electrical Engineering Programme
- Automation
- Electronics
- Installation

Energy Programme
- Energy
- Heating, ventilation and plumbing
- Shipping technology

Foodstuffs Programme
- Baking and pastry making
- Fresh and cured meat products

Handicraft Programme

Health Care and Nursing Programme
- Dental nursing
- Health care

Hotel and Catering Programme
- Hotel
- Restaurant
- Large scale catering

Industry Programme
- Industry
- Process
- Textiles and garments
- Wood

Media Programme
- Information and advertising
- Printed media

Natural Resources Programme

Vehicle Programme
- Aircraft maintenance
- Body work
- Vehicles
- Transport

General/theoretical programmes

Social Sciences Programme
- Economics
- Humanities
- Social Studies

Science and Technology Programme
- Science
- Technology

Table 1
National vocational and general/theoretical programmes

nicipal adult education, the core subjects Sports & Health and Arts Activities are eliminated.) The concept of a block of core subjects not only contributes to raising the status of graduates of vocational programmes, it also provides a solid basis for further education at the upper secondary and post-secondary adult education level and at the university/university college level. Even more importantly, it contributes to achieving the general goal of Swedish education identified as ***lifelong learning*** (see also above in Section "Present Situation - Period of Transition" regarding lifelong learning, page 7).

b) *Making all education programmes, including the vocational programmes, three years in length. This is an important step away from the old system where many vocational "lines" were only two years in length.*

National timetables for these programmes state the guaranteed minimum time for instruction by teacher or supervisor.

Table 1 (page 8) shows a list of the fourteen national vocational programmes and branches offered in youth and adult education, followed by the two general/theoretical programmes.

The latter concentrates on general science and technological theory and prepares the student for further studies to become a graduate engineer, or to participate in research programmes.

It is important to note that the sixteen national programmes are not static, since municipalities now have the authority to create other branches to satisfy local and regional needs. These are usually related to vocational opportunities in the region, such as the quarry industry, local tourism, the textile industry, etc.

One of the most far-reaching results of the Reform is that **all** of the sixteen national programmes provide the student with general eligibility to continue his/her studies at the post-secondary or university level, whereas in the old system students in the technical and vocational education lines often had to supplement their education before becoming eligible for further studies.

The sixteen national programmes are not the only programmes available to students. The Reform, promoting non-centralised reasoning and practice as well as implementing the concept of freedom of choice to a much greater extent than before leads to the possibility of both specially-designed programmes and individual programmes.

Specially-designed programmes are those that mainly parallel a national programme but study specific subjects more deeply or with another orientation than the national programme. This type of programme is always three years in length, and is mainly intended for extremely goal-oriented students interested in a specifically composed programme to meet the individual requirements of certain vocational or theoretical professions, requirements that may not be covered by the national programmes. The student can combine theoretical and vocational subjects from any of the national programmes, however, the core subjects and a special project are compulsory components.

Individual programmes enable an individual to compose a programme that more suits his/her specific needs. Most individual programmes are compensatory one-year programmes aimed at preparing the individual to enter a national programme after completion. A small percentage are motivational programmes that seek to counsel and encourage unmotivated students (and students who have dropped out) to choose and complete an existing national programme. Individual programmes can also be programmes for students interested in unusual occupations not covered in the national programmes, or for students who live very far away from the school offering the desired programme. The opportunity to create individual programmes is also oriented toward immigrant youths (and immigrant adults in adult education) to enable them to study Swedish and English more intensively, possibly combined with e.g. guidance in their own language.

A special variant of the individual programme is the ***Apprenticeship Training programme***. This programme is always three years in length. It combines vocational training at a company in the form of employment, with studies. The studies must include the core subjects. Apprenticeship training is intended for students who are highly motivated to learn a vocation but much less motivated to study theoretical subjects.

In statistics based on upper secondary education in October 1992, the first year after the Reform was instituted, approximately 25% of those students

studying in the reformed upper secondary school followed individual programmes. This should be seen in relation to the very initial character of such statistics and the fact that implementation of the Reform is still in the transitional stages. The figure 25% shows the necessity of flexible programmes in today's education, but this figure is expected to drop to around 5% when the Reform is in full effect by the turn of the century.

As mentioned above, when the course-oriented structure is fully introduced, every student will in effect have the possibility to create his/her own individual programme.

Interesting to note here is that the number of boys and girls studying individual programmes was rather evenly distributed in the age group 16-17 year olds, but that girls dominated in the age group 18-20 year olds (pg 41, *Beskrivande data om skolverksamheten - 1993*).

Again, in all such specially-designed and individual programmes, the core subjects must be given a share equivalent to the established national programmes.

c) Introducing a new form of "workplace-related" education.

The school and the company where the training takes place now cooperate much more closely, with the company taking the main responsibility for the student's time and training within the company. At least 15% of the total study time in the programmes in technical and vocational education is to be assigned to the workplace.

The main idea behind this new form of workplace-related training is the belief that this alternating responsibility for the student will achieve the best possible use of the student's time in school and in the company. This ensures higher quality education due to three important results:

- the integration of general knowledge and specific vocational theory provided in a suitable pedagogical context with guaranteed up-to-date technological methods and equipment,
- closer links between the schools and industry, assuring a continuing dialogue regarding industry needs, qualifications and skills, and

an easier transition from school life to working life for the student, allowing the student to smoothly ire the social competence necessary in king life.

Compensation for apprenticeship training and workplace-related training: The compensation received by the companies for apprenticeship training and workplace-related training is under discussion at this time. Normally, each company receives a subsidy from the municipality to offset company costs for making supervisors and facilities available. Although the student's tasks during his/her apprenticeship or workplace-related training must preserve the status of the student purely as a student, the student receives a "salary" as an extra incentive, the amount of which is determined in accordance with the prevailing agreements between the national employee association and the national trade unions.

d) Revising the assessment of qualifications

There will be a new system of *goal-related marks* in effect as of July 1, 1994. The old system of relative marks was based on a 5-point scale (5 as excellent, 3 as average, 1 as inferior). After the reform has taken full effect, upper secondary schools will award marks according to a 4-point scale: Passed With High Distinction, Passed With Distinction, Passed, and Not Passed. The new goal-related marks are expected to provide a clearer indication of how successful student has been.

Discussions are going on right now about the value and significance in technical and vocational education of a supervisor's certificate as a form of evaluation of the 15% of vocational education that is assigned to the workplace. Character judgements such as diligence, industry, and personal suitability could be included, however, it must be emphasized that there are no official recommendations or directives at this time on this matter.

3 Future Developments

The following are developments that technical and vocational education in Sweden must take into consideration.

Professional skills will need to be broadened and applied in new ways.

Social skills will be necessary to cooperate and communicate effectively with various persons at various levels in company organisation. This also places more emphasis on foreign languages and cross-cultural knowledge as international contacts become more and more frequent.

Greater demands will be placed on personal skills and flexibility.

Working in groups will become more usual as traditional hierarchies are replaced by cross-departmental resource groups.

New technologies will demand a new type of manager and a new type of subordinate. In fact the word "subordinate" will be replaced more and more by "colleague" as people learn to respect each other's competence and contributions.

Individuals will expect and demand challenge and opportunities for personal growth in their work, at all levels.

4 Adult Education

Adult education is not to be confused with higher education. The origins of adult education in Sweden lie in providing an inexpensive (usually free) opportunity to improve vocational skills in an informal but serious setting, that also encouraged social intercourse. This has developed in different directions, extending also now to formal education administered by the state and, mainly, the municipalities.

Almost 50% of Sweden's adult population is enrolled in some form of adult education. This high rate is due in part to long traditions in educational opportunity for adults and in part to the great variety of adult education institutions.

In the Reform, the state and municipalities must offer education to all youths up to 20 years of age. After this age, a person must procure his/her further education through one of the following types of adult education, or through university or university college education:

- Adult Study Associations
- Folk High Schools
- Government Labour Market Education
- In-Company Training
- Training sponsored by Employee Organizations
- Radio, TV and Correspondence Courses
- National Schools for Adults (two in Sweden)
- Swedish for Immigrants Education
- Public Libraries and Audio-visual Centres
- Municipal Adult Education.

Recent figures state that approximately 160,000 persons are enrolled in Municipal Adult Education, of which 100,000 are women. 45% of the enrolled students study subjects at the compulsory school level, 30% study at the upper secondary level, and 25% study technical/vocational education courses. The percentage of technical and vocational education will increase since municipal adult education is now used as a tool in labour market policy.

A new dimension has been added over the last decade to municipal adult education. Municipalities can now sell courses to "customers" among industry, banks and other commercial units, government authorities, etc., on a contract basis. The volume of these contracted courses, also known as commissioned courses, was in 1993 around 20% of the total municipal education offered. This type of education will have a great impact on technical and vocational education since it promotes closer cooperation between industry, upper secondary education and post-secondary education.

Another new type of education potential utilized in municipal adult education and in youth upper secondary schools is that represented by so-called local courses. The Reform not only provides extensive local freedom in the allocation of funds (see Section "Teacher Certification and Supplementary Training", page 14 regarding this) but also in the creation of courses outside the national programmes. This is very advantageous for developing technical and vocational education, not only in fulfilling regional demands for vocational skills, but also in enabling hitherto unusual combinations of educational subject and target group, i.e. to tailor-make courses for technical-vocational groups, e.g. communication for engineers, marketing for food-stuffs industry professionals, etc. These courses can be tailored to meet local industrial needs at many different levels.

Especially in times of recession, such as Sweden has recently experienced and which probably is not over yet, commissioned courses and local courses have been able to quickly meet the swiftly changing demands not only of the labour market itself but also of the labour market exchanges seeking courses to train/retrain large numbers of unemployed. Here is where technical and vocational education in the adult education system has

been most effective. This means that local courses have become a powerful tool to keep up with regional and local demands.

In the past, the intent of municipal adult education has been two-fold,
compensatory in that it has provided the opportunity to many adults to fill in the gaps in their compulsory education that could exist for a *variety of reasons*, and
supplementary in that it has provided adults with the opportunity to augment and strengthen their basic skills and competence in order to achieve better jobs and better lives.

Today's Reform means that adult education is considered not only to be a second chance for many to compensate and supplement their original education as youths, but also as a bridge between upper secondary education and university/ university college education, *and* increasingly as a fertile area in itself for different initiatives/ avenues in post-secondary education. This will allow exploitation of the possibilities offered not only by commissioned education, but also traditional formal education. Again, students in technical and vocational education are expected to reap great benefits from the developments in this intermediate level between the upper secondary and university/university college levels. The curriculum, syllabi, teaching materials, and assessment criteria are in transition here, too.

New tools in adult education and university education include three new strategies specified in the Reform, to be implemented over a period of time. These strategies are deemed valuable not only in the short run for increasing competence in today's labour market situation, but also in the long run in contributing to structural change in the system. Thus they combine education policy and labour market policy by solving contemporary problems on the labour market while at the same time being instruments of the education system for achieving and maintaining a high standard of living.

The three strategies *are:*

1) Educational Vouchers
This strategy is seen as promoting diversity and providing the individual with complete freedom in choosing an educational institution (e.g. company offering education, education association, university, municipal adult education school, etc.) The voucher must however be used for education in an area that will increase the individual's competence and prospects on the labour market, e.g. foreign language training.

2) Post-secondary Trainee Education
This is a particularly significant strategy for medium-sized and small companies. It is a form of apprenticeship training, but intended for education at the post-secondary level. It combines advanced theoretical training at universities or municipal adult education schools, with on-site training at the chosen company or a combination of companies. This type of training previously was only available in large companies.

This strategy, since it is oriented toward small and medium-sized companies may be seen also as an effort to alleviate one of the effects of the reformed technical and vocational education that could be seen as a disadvantage for small and medium-sized companies, namely that students graduating from the national vocational programmes will be less specialized than before - they will be more generally competent in the chosen vocation, but with more emphasis on competence in social and problem-solving skills.

3) Summer Courses at Universities and Municipal Adult Education Schools
Sweden has lagged behind other countries in fully utilizing its higher education resources year-round. Funding for this as well as revised study assistance programmes will enable the development of a complete curriculum available in the summer at different educational institutions.

5 Improving Participation of Special Social Groups

Four groups are given particular support in order to improve their participation in national education, and particularly the opportunities offered by technical and vocational education: Girls, immigrants, the mentally handicapped and the physically handicapped.

In the 1980s, special efforts were made to help girls apply to male-dominated vocations and boys to apply to female-dominated vocations. If education courses the year before had less than 30% of the under-represented sex, then individuals from this under-represented group received extra

eligibility points on applying to school. This measure, however, did not seem to improve the situation, and today it is thought to foster inequality and has been withdrawn. Now, individuals can apply under the *free quota system*, which means that they can cite certain priorities, e.g. medical disability, long vocational experience, incomplete basic schooling, etc., anything that the individual can prove as being special for him/her. Technical and vocational education is not given any special status in application procedures. The national programmes and branches are intended to attract both girls and boys. Evaluations at the end of the transition period and in the first years of implementation of the Reform will show whether or not this strategy is useful.

Several measures must be mentioned in this context:

a) frequent information campaigns are carried out to encourage individuals from the under-represented groups to apply to relevant vocational education programmes

b) unemployed persons are sometimes offered opportunities to complete local, specially-oriented courses that are meant to inform and enthuse an under-represented group about vocations seldom considered in that specific group.

   Girls are not specifically targeted in the above two measures. However, as technology advances into our daily personal and working lives, girls are an obvious direct target group for these two measures. Girls and traditionally female vocations are also an indirect target of these measures due to the fact that as men enter female-dominated vocations, they usually bring about a general increase in status and salary for that vocation. Many persons would today assert that an interesting side effect of the presence of more women in male-dominated vocations is the acceleration of the fulfilment of the demands for more personal and communication skills in the workplace that technical and vocational education must take into consideration (see Section " Future Developments", page 10).

c) summer courses in general science and technology are sometimes offered for girls in the secondary schools (13-16 years old). This is up to the individual municipalities. Government subsidies are available for these summer courses as well as for other efforts during the school summer holiday to encourage girls to be interested in these fields (SKOLFS 1994:4).

d) Women in regions where there is extensive unemployment or outdated industries are offered help in the form of special courses or financial aid to open their own businesses, based on business ideas that will promote the region. (See also Section " Entrepreneurial Orientation and Technical and Vocational Education", page 16, regarding entrepreneurial-oriented vocational education strategies for "Starting Your Own Business".)

e) For handicapped persons, a national agency has now been established to work on questions concerning education and teaching materials for the mentally handicapped - the National Swedish Agency for Special Education. The programmes are the same for youths and adults as in the regular school programmes. The basic goals for technical and vocational education for the mentally handicapped are to improve an individual's self-confidence and increase his/her potential to influence the daily activities of his/her life. The physically handicapped are relatively well cared for in Sweden. In southern Sweden, there are several institutions, for example, a school for adults with serious physical handicaps that is scheduled to become a Folk High School and as such will not only be able to participate in but also offer graduation certificates in the national education programmes.

   In addition, there are several national upper secondary schools for the handicapped, each one integrated with a regular upper secondary school in the region.

6 Financial Resources and Financing

Each Municipality receives a subsidy from the State for use in financing its school activities. This subsidy is not ear-marked for schools but is part of a larger total amount granted to the Municipality according to certain principles. It is then up to the Municipality to decide how much will be allocated to different municipal activities, e.g. for technical/vocational education. The State only demands that the Municipality fulfil the

educational goals set by the State. The Municipality has, however, extensive freedom in the organization of its school activities. Through continuous evaluation by the National Agency for Education, the State can verify that the Municipality is fulfilling the goals.

Every Municipality is responsible for offering upper secondary education based on a comprehensive selection from the national programmes for all youths in the Municipality aged 16-19. Great consideration must be given to the requests and choices of the youths of the Municipality. It is also up to the Municipality whether or not all of the vocational and technical programmes will be offered, or if the courses in certain programmes will be "bought" in a neighbouring Municipality.

The subsidy from the State is not intended to cover all expenses for education in the Municipality. The Municipality is expected to be responsible for approximately 50% of these expenses. Examples of expenses that are considered to be the responsibility of the Municipality have traditionally been the expenses for buildings, equipment, and teaching materials.

Expenses are not broken down into cost areas such as technical and vocational education or general-theoretical studies. The total expenses for the upper secondary school were approximately 17.4 thousand million SEK in 1992, of which half may be expected to have been used for technical and vocational education. In 1992 expenses for municipal adult education were approximately 2.5 thousand million SEK, of which only a minor part may be expected to have been used for technical and vocational education.

As mentioned above, in municipal adult education, commissioned courses have become a valuable tool in labour market strategy. These courses are paid for totally by the commissioning customer, although premises and equipment may be shared with regular municipal adult education.

7 Teacher Certification and Supplementary Training

In order to be permanently employed as a teacher, the applicant must:

- have full command of the Swedish language
- possess the necessary insights into the regulations concerning public schooling and especially the goals for the relevant education
- have successfully completed the Swedish teacher certification programme oriented primarily towards that type of education for which the employment is intended (or a programme in another country that is ajudged equivalent).

Education leading to the upper secondary school teacher certificate, including education for teachers in technical subjects for the Science and Technology Programme, covers a period of 4-5 years of university studies. This education prepares the teacher to teach general-theoretical subjects in the upper secondary schools and in municipal adult education. Each teacher normally is certified to teach at least two subjects. Usually, each subject has been studied for 1.5 years and these studies are combined with 1 year of practical/pedagogical studies.

Persons who already have university degrees, for example in economics or engineering, can complete a teacher training programme of 1 year in order to become eligible for certification.

For vocational teachers, the education is shorter and is usually equivalent to one year of studies for most vocational subjects. In order to be eligible for this teacher certification, the applicant must:

- have an upper secondary school certificate
- have at least 4-5 years of professional work experience oriented on the intended area of certification
- successfully complete the 1st year of university studies of pedagogy and methods.

Under the Reform, the curriculum for upper secondary education (youth and municipal adult education) stipulates that, in addition to the specific knowledge and skills relevant to the subject taught, the teacher's responsibility includes the following:

- *promote* the student's specific knowledge and social skills through personal development conferences
- *cooperate* with other teachers to form a team in order to achieve the education goals for the students.

- *base* his/her teaching on the premise that each student can and wants to take personal responsibility for their studies
- *make certain* that all students receive the chance to influence work methods, work forms and the content of the education
- *plan and evaluate* the lessons together with the students

The need to *cooperate* with other teachers applies especially to teachers in technical and vocational education who must coordinate their students' education in the school with training at different commercial/industrial companies.

The above requirements, in their orientation and gravity, lead to a serious need for supplementary training for teachers. The need for in-service training is also based on the increased demands on the professional knowledge each teacher possesses, knowledge that must be constantly updated in order to stay in touch with both local and global events that have an impact on the subject taught. An example of one new area that all teachers must become proficient in and must include in some way in their lessons is that of knowledge of the environment.

The format and content of supplementary training for teachers may be asserted as one of the most important questions in education today, both for teachers of general/theoretical subjects and of vocational subjects. The achievement of tangible developments in professional competence in today's and tomorrow's teachers is of the greatest urgency. The Swedish Parliament has stated that supplementary training should meet three different needs:

- the individual teacher's need for development
- the needs based on specific relationships at a certain school or in a certain municipality
- the needs created by the sixteen national programmes and the national ambition of ***lifelong learning.***

Strategies for teachers in technical and vocational education will include not only the requirement of learning skills to facilitate his/her role as "manager/coordinator" of vocational training but also the requirement of spending periods of time at a relevant workplace in order to keep informed of changes in that vocation.

It is the responsibility of the Headmaster to make sure that the administrative and teaching staff have the competence to perform their tasks in a professional manner. It is the responsibility of each Municipality to make sure that supplementary training is accessible to all teachers and that the training takes place. The National Agency for Education, newly established under the Reform, is responsible for centrally organized supplementary training for teachers.

It was not always the case that the Headmaster or the Municipality has specific responsibilities for in-service training. Centrally organized interest on the part of the State has always been in the areas of the actual teaching and course content, but it was not until the beginning of the 20th century that the State took an interest in Pedagogy, introducing it as a new discipline at the university. This meant that pedagogical research was reserved for specialists outside the classrooms, with the result that teachers became "users" of the results of this research produced by pedagogical experts, and "performers" following a script set by the State. Thus the space for professional development was shrinking and teachers were made obedient state servants.

In the 60s, supplementary training became important to the State, and centrally determined in-service training material was produced, influenced to a large extent by American research. New teaching materials and standardized tests further restricted the already limited professional freedom for teachers.

In the 70s and 80s it was finally recognized that the pedagogy still dominating in the classroom was old-fashioned and should be replaced with more problem-oriented teaching methods. The Reform now in progress thus represents a new strategy in both preparation and implementation of supplementary training; that ***of putting more responsibility into the hands of the teachers themselves*** for determining the goals and execution of their own supplementary training. Teachers now have the freedom to observe their practical work, reflect on the outcome, formulate new ideas regarding teaching, and individually seek the training that they perceive to be instrumental in fulfilling the goals and ambitions of the national programmes - in effect, to become professionals. This freedom is available to all

teachers; teachers in technical and vocational education included.

8 Entrepreneurial Orientation and Technical and Vocational Education

In the past, Sweden has not had a strong tradition of individual enthusiasm or government support for small businesses. Assistance such as tax-breaks, professional advice, financial aid from banks, etc., has not been widely available. Moreover, education, especially technical and vocational education, has not taken advantage of the unique possibilities to enthuse young people with the idea that they could start their own business and to prepare them for the economic and organizational realities of such an investment of time and money. In today's economic recession it has become an absolute necessity to help persons with viable business ideas to get the education they need to successfully realize these ideas. Sweden has, however, over the recent decades, become aware of the value of small businessmen to the continued existence of a democratic society, which the Reform takes into serious consideration. Thus, the study of basic business economics is now included in fifteen of the sixteen national programmes (the theoretical Science and Technology Programme does not include any study of economics). In addition, further economics education is offered in the course Business Economics for Small Businesses in seven of the vocational programmes (as well as in the Economics branch of the Social Sciences Programme).

For those who are 20 years or older, i.e. considered to be adults in the education system, the above courses are offered in the regular upper secondary programmes under the auspices of municipal adult education.

"For those adults who have a business idea, there are special courses called "Starting Your Own Business" which can be combined with a six-month government subsidy for participants who are unemployed. The amount of the subsidy is equivalent to each participant's usual unemployment benefits and is seen as a "salary". In order to receive the subsidy, the aspiring businessman/businesswoman must submit his/her business idea to an assessment panel. Other subsidies and favourable loans are available from the government to defray investment costs involved in starting a business. An advantageous loan programme for 50 million SEK was recently made available to women only.

Starting Your Own Business" courses usually cover a total of 2-3 weeks and are not "vocational" in the sense that they provide skills for a specific vocation. However, they provide the skills necessary to running a small business, such as knowledge of relevant laws, patent application, administration, planning and control, management, analysis, basic accounting, marketing, quality, etc. For those with first-class vocational skills this education is the key to realizing a certain way of life. This strategy has encouraged not only men but also women to take a decisive step in the process of opening their own businesses. It has also been invaluable for opening the door to

Course	Course Name	Taught in Programme
FE203	Basic Business Economics	• 15 programmes (all programmes except Science and Technology Programme)
FE201	Advanced Business Economics	• Business and Administration • Handicraft • Natural Resources • Social Sciences
FE200	Business Economics for Small Businesses	• Business and Administration • Foodstuffs • Handicraft • Hotel and Catering • Industry • Natural Resources • Social Sciences • Vehicle
FE205	Organization and Management	• Business and Administration • Health Care and Nursing • Social Sciences
FE206	Personnel Administration	• Business and Administration • Social Sciences
FE202	Export and Import	• Business and Administration
FE207	Financing and Calculation	• Social Sciences
FE204	International Economics	• Social Sciences

Table 2
Economics Courses in the National Programmes

Swedish society for immigrants with skills and business ideas.

As mentioned above, Sweden has not had a tradition of encouraging small businesses and there is a shortage of such businesses in Sweden's national economic picture. During the past years of recession and privatisation, many observers and analysts have raised their voices in warning of this situation and in encouragement of support for a broader small business sector. This type of "vocational" education in the form of "Starting Your Own Business" courses combined with the raised status of vocational education, as well as the introduction of the courses in basic business economics and business economics for small businesses under the Reform is expected to lead to an increase in the number and status of small businesses in Swedish society.

Table 2 (page 16) shows how economics is taught in the fifteen programmes.

9 Cooperation between the Schools and Industry

In the past decade especially, industrial vocations experienced further losses in status and appeal among youths. Many industrial workers were recruited from amongst students who either had low grade averages or who had very little interest in industry, choosing such vocations only as a last resort. The revolutionary changes in information transfer and technology in general have led to an acute awareness of the need for high competence and excellent knowledge in vocational skills as well as in general school subjects.

Representatives from the national employers association and the trade unions have set up national vocational councils for the purpose of input and follow-up concerning matters relevant to vocational education. There are also local representatives for these groups with whom the local school boards are now developing closer ties due to the necessity of cooperation and consultation on essential vocational education issues. The goal here is to set up local municipal centres or "forums" for organized discussions between representatives from employers, employees and the schools regarding technical and vocational education in order to keep it updated and viable.

Several private industries have taken their own initiative and set up different forms of cooperation with the upper secondary schools in order to ensure relevant technical and vocational education. One example of this is found in the town of Skövde where cooperation between three parties: Volvo Car Corporation, a local university college, and an upper secondary school, has lead to the creation of a Vehicle Engineering Centre. Volvo has a long tradition of programmes for integrating apprenticeship training with theoretical and practical upper secondary education. Today, in conjunction with the Educational Reform, three steps have been taken to create the new model intended to meet future demands:

Based on the concept of ***life-long learning***, the existing apprenticeship training has been revised to constitute the first step in continuous training, to make it possible for the apprentice student to go on with his/her studies and become a qualified engineer.

The content of the apprenticeship training has been adjusted to meet the goal of developing technological competence.

A specially-designed programme has been initiated, combining aspects of the national programme for science and technology with vocational studies in industrial and vehicle engineering.

The participating students have been offered a period of apprenticeship training over the three years in the company, studying full-time (40 hours a week), which means that the six school years will be completed in three years.

Another company in Volvo Car Corporation, the Volvo Olofström Stamping Plants, has decided to attack the problem of the widespread lack of interest and misunderstanding concerning industrial vocations among youths today. Several projects have been initiated in cooperation with the schools in the Olofström area, parallel to the traditional cooperation between Volvo and upper secondary and higher education:

Interest and pride for third graders (9-10 year olds):
Parents who work at the Volvo Olofström Stamping Plants give informal presentations about their work and the company, and answer questions

that the children have. This is usually very enlightening information and makes the children proud of their parents and the parents of their friends, as well as sows the seeds of interest in working in heavy industry.

Production for sixth graders:
Sixth graders are informed in the classroom about pre-production and production activities, i.e. design, stamping and assembly, and then given the chance to see actual production operations at the plants.

Technology for elementary school teachers of 4th-6th grades:
In cooperation with the Industrial Development Centre of Olofström, Volvo offers its facilities to a teacher supplementary training programme in which elementary school teachers can up-date and expand their knowledge in matters concerning modern technology and production. These teachers can then provide their pupils with a more correct, detailed and vital picture of technology.

Technology summer school for 8th graders (15 year olds):
Experience and training in the activities at the stamping plants are provided in a summer course that is aimed at encouraging boys and girls to choose technical programmes when they must make a decision regarding which national programme to study after completing the 9th grade.

Workplace-related training for upper secondary school students:
Volvo participates in the regular workplace related training offered under the old programmes and the reformed national programmes.

Cooperation with the university colleges:
Volvo is often the site of course work projects for students at the university colleges in the Southern Sweden region.

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Appendix I: Fact Sheets on the Sixteen National Programmes

Vocational Programmes:

General/theoretical Programmes:

Guidelines for reading the Fact Sheets

In order to graduate from a programme, the student must successfully complete:

- the required core subjects
- the required compulsory subjects for the chosen programme
- the required compulsory subjects for the chosen branch, and
- the individually selected electives.

This means that all students at youth upper secondary schools study the eight "core" subjects specified in section A on the fact sheets. These "core" subjects comprise the basis for participation in a democratic society, and for achieving lifelong learning. Then according to the respective programme and furthermore according to his/her choice of branch, the students study certain "compulsory" subjects in common with the other students in the same programme and ultimately, in the same branch. Each student then individualizes his/her programme by selecting a certain number of "electives" to study which are especially important to his/her individual educational goals.

Each course in the programmes carries a certain number of points. One point is equal to one lesson hour (40 minutes). The core subjects, compulsory subjects, and electives must be combined to achieve the minimum total number of points for luation from a programme:

Vocational	2,400
(1,370 points in vocational subjects)	
General/Theoretical	2,180

Note: The Arts Programme requires 2,180 points to graduate.

Only the points for the eight core subjects are specified on the fact sheets. As pointed out in the footnote on each fact sheet, the information on the fact sheets often refers to subjects, not specific courses studied in the programmes/branches and because of this, points cannot correctly be specified. Please see Appendix II (page 30) for an example of a completely specified programme, the Vehicle Programme.

Students at Municipal Adult Education schools can graduate from the Social Sciences programme or the Science and Technology programme. The programmes are otherwise highly individualized. All students study the core subjects but then each student is free to create his/her own programme based on a combination of courses from the different national programmes. To graduate with an upper secondary school certificate, the adult student must obtain 1,990 points.

Arts Programme*

A Core subjects and compulsory subjects (in the order of value in study points):

Swedish	200 pts
A: Language and Mankind	
B: Language - Literature - Society	
English A	110 pts
Mathematics A	110 pts
Civics A	90 pts
Sports and Health A	80 pts
Religion A	30 pts
General Science A	30 pts
Arts Activities	30 pts

Compulsory subjects in the Programme:
English B
History A
Mathematics B

B Vocational subjects in the Programme

Compulsory subjects
Basic Work Environment Knowledge
Basic Computer Science
Orientation in the Arts
Basic Business Economics
Basic Cultural History

Electives
Arrangement and Composition
Children and Music
Children, Dance and Theatre
Choir
Composition
Computer Graphics and Sound
Conducting and Ensemble Conducting
Cultural History
Dance Improvisation and Design - Textiles and Fashion
Design in Metal
Design - Textiles and Weaving
Design in Wood
Design in Ceramics and Glass
Design - Environment
Dramatic Form and Composition
Graphics
History of Art and Design
History of Dance and Theatre
History of Music
Images and Illustrations
Instrument/Song
Moving Pictures
Music Production and Sound Music for Dance and Theatre
Painting and Sculpture
Photographic pictures
Rhythm with Dance
Scenography
Staged Music Project
Techniques
Theatre Techniques
Visualization

C Vocational subjects in the Programme branches

C1 Dance and Theatre

Compulsory courses
Music for dance and theatre
Theatre production

Electives
Dance, form and acting
Dance training
Physical training
Acting on stage

C2 Art and Design

Compulsory courses
Images
Design

C3 Music

Compulsory courses
Ensemble
Pitch and music
Instrument/Song
Music and communication

Building and Construction Programme*

A Core subjects and compulsory subjects (in the order of value in study points):

Swedish	200 pts
A: Language and Mankind	
B: Language - Literature - Society	
English A	110 pts
Mathematics A	110 pts
Civics A	90 pts
Sports and Health A	80 pts
Religion A	30 pts
General Science A	30 pts
Arts Activities	30 pts

B Vocational subjects in the Programme

Compulsory subjects
Basic Work Environment Knowledge
Basic Computer Science
Basic Business Economics
Basic Electricity
Building Construction Techniques

C Vocational subjects in the Programme branches

C1 Structural Sheet Metals

Compulsory courses
Construction Techniques

* Note that the above is mainly an overview of the subjects, not the actual courses offered, which are often more numerous

Electives
Advanced Construction Techniques
Vocational Construction Techniques

C2 Building and Site Preparation

Electives
Site Construction Machine Techniques
Site Construction Techniques
Vocational Site Techniques
Heavy Vehicle Technology

C3 Painting

Electives
Building Techniques
Vocational Painting Techniques
Vehicle Painting Techniques

Business and Administration Programme*

A Core subjects and compulsory subjects
(in the order of value in study points):

Swedish	200 pts
A: Language and Mankind	
B: Language - Literature - Society	
English A	110 pts
Mathematics A	110 pts
Civics A	90 pts
Sports and Health A	80 pts
Religion A	30 pts
General Science A	30 pts
Arts Activities	30 pts

B Vocational subjects in the Programme

Compulsory subjects
Work Environment Knowledge
Basic Computer Science
Basic Business Economics
Advanced Business Economics
Basic Administration
Trade (marketing, sales, purchasing and storage, etc.)
Trade and Administration

Electives
Advanced Administration
Business Economics: Export and Import
Business Economics: Personnel
Business Economics: Organization and Management
Business Economics: Small Businesses
Trade
Trade: Sales
Trade: Advertising
Trade: Transport
Tourism and Travel Service

Children and Recreation Programme*

A Core subjects and compulsory subjects
(in the order of value in study points):

Swedish	200 pts
A: Language and Mankind	
B: Language - Literature - Society	
English A	110 pts
Mathematics A	110 pts
Civics A	90 pts
Sports and Health A	80 pts
Religion A	30 pts
General Science A	30 pts
Arts Activities	30 pts

B Vocational subjects in the Programme

Compulsory subjects
Work Environment Knowledge
Basic Computer Science
Basic Business Economics
Knowledge of Children and Recreation
Pedagogy for Children and Recreation

Electives
Activities for Children and Recreation
- Play & Sports
- Library Activities
- Culture
- Handicap and Recreation
- Swimming
- Creative Drama
- Skiing
- Child Care
- Nature and Outdoor Recreation

Electrical Engineering Programme*

A Core subjects and compulsory subjects
(in the order of value in study points):

Swedish	200 pts
A: Language and Mankind	
B: Language Literature Society	
English A	110 pts
Mathematics A	110 pts
Civics A	90 pts
Sports and Health A	80 pts
Religion A	30 pts
General Science A	30 pts
Arts Activities	30 pts

B Vocational subjects in the Programme

Compulsory subjects
Basic Work Environment Knowledge
Basic Computer Science
Basic Electronics
Basic Electricity
Basic Business Economics
Quality Technology in Production
Basic Control Technology
Basic Workshop Techniques

Note that the above is mainly an overview of the subjects, not the actual courses offered, which are often more numerous

Electives
Restricted Electrical Certificate BB2
Basic and Advanced Technology

C Vocational subjects in the Programme branches

C1 Automation

Compulsory subjects
Computer Science (CAD)
Electricity 3-phase AC current
Measurement and Control Systems
Control Technology using a PC

Electives
Advanced Electronics
Electronics Systems
Advanced Measurement and Control Systems
Advanced Control Technology
Welding Techniques
Workshop Techniques
Maintenance Hydraulics

C2 Electronics

Compulsory subjects
Advanced Electronics

Electives
Advanced Computer Programming and Applications
Advanced Electronics
Advanced Electronics Systems
Electricity: 3-phase AC
Electricity: Kitchen and Laundry Appliances
Medical Equipment
Basic Medical Knowledge
TV/Alarm/Network Installation

C3 Installation

Compulsory subjects
Electricity: 3-phase AC
Measurement and Control Systems
TV/Alarm/Network Installation

Electives
Computer Science CAD
Electrical Distribution
Electronics
Electrical Installation
Electrical Appliances
Advanced Measurement and Control Systems
Control Technology
Advanced TV/Alarm/Network

Energy Programme*

A Core subjects and compulsory subjects (in the order of value in study points):

Swedish	200 pts
A: Language and Mankind	
B: Language Literature Society	
English A	110 pts
Mathematics A	110 pts
Civics A	90 pts
Sports and Health A	80 pts
Religion A	30 pts
General Science A	30 pts
Arts Activities	30 pts

B Vocational subjects in the Programme

Compulsory subjects
Basic Work Environment Knowledge
Basic Computer Science
Basic Electricity
Basic Energy Technology
Basic Business Economics
Environmental Science Energy
Measurement and Control Systems
Basic Control Technology
Basic Workshop Techniques

Electives within the Programme
Basic Electronics
Electricity: 3-phase AC + appliances
Advanced Energy Techniques
Maintenance Hydraulics

C Vocational subjects in the Programme branches

C1 Energy

Electives
Restricted Electrical Cert. BB2
Buildings: Operation Technology
Vehicle Tech. small machines
Combustion Engine Technology
Power and Heating Technology
Cooling and Heat Pump Tech.
Water Sewer Technology
Basic & Advanced Water Power
Heat Water Sanitation

C2 Shipping Technology

Electives
Shipping Technology: Safety
Shipping Technology: Maintenance
Shipping Technology: Operation
Shipping Technology: Fishery
Machinist Certificate
Master's Certificate
Electricity: 3-phase AC
Electricity: Kitchen and Laundry Appliances
Medical Equipment

* Note that the above is mainly an overview of the subjects, not the actual courses offered, which are often more numerous

Basic Medical Knowledge
TV/Alarm/Network Installation

C3 Water-Heat-Sanitation (WHS)

Electives
Restricted Electrical Cert. BB2
Basic WHS technology
WHS Welding
WHS Advanced heating
WHS Advanced sanitation
WHS industrial pipes

Foodstuffs Programme*

A Core subjects and compulsory subjects
(in the order of value in study points):

Swedish	200 pts
A: Language and Mankind	
B: Language Literature Society	
English A	110 pts
Mathematics A	110 pts
Civics A	90 pts
Sports and Health A	80 pts
Religion A	30 pts
General Science A	30 pts
Arts Activities	30 pts

B Vocational subjects in the Programme

Compulsory subjects
Basic Work Environment Knowledge
Basic Computer Science
Basic Business Economics
Trade Sales and Service
Hygiene
Basic Knowledge of Foodstuffs
Foodstuffs Technology
Knowledge of Material and Machines
Basic Nutrition

Electives
Basic Electrical Safety
Business Economics Small Businesses
Basic Food Preparation Cold Dishes
Advanced Nutrition

C Vocational subjects in the Programme branches

C1 Bakery and Patisserie

Compulsory subjects
Basic Bakery
Basic Patisserie
Foodstuffs Knowledge
for Bakery and Patisserie

Electives
Bakery production
Advanced Patisserie: Chocolate
Advanced Patisserie: Confectionery
Advanced Patisserie: Production

C2 Fresh and Cured Meat Products

Compulsory subjects
Basic Knowledge of Cured Meat
Foodstuffs: Butchery/Cured Meat
Basic Butchery

Electives
Cured Meat: production
Food Prep: in quantity/catering
Food Preparation: hot dishes
Advanced Butchery: pork/beef/other

Handicraft Programme*

A Core subjects and compulsory subjects
(in the order of value in study points):

Swedish	200 pts
A: Language and Mankind	
B: Language Literature Society	
English A	110 pts
Mathematics A	110 pts
Civics A	90 pts
Sports and Health A	80 pts
Religion A	30 pts
General Science A	30 pts
Arts Activities	30 pts

B Vocational subjects in the Programme

Compulsory subjects
Basic Work Environment Knowledge
Basic Computer Science
Basic Electrical Safety
Basic Business Economics
Business Economics Small Businesses
Knowledge of Handicraft Orientation and Service
History of Culture and Style

Electives
Advanced Business Economics
Knowledge of Handicraft: materials
Knowledge of Handicraft: repair and storage
Basic Handicraft Techniques
Advanced Handicraft Techniques

*Note that the above is mainly an overview of the subjects, not the actual courses offered, which are often more numerous

Health Care and Nursing Programme*

A Core subjects and compulsory subjects (in the order of value in study points):

Swedish	200 pts
A: Language and Mankind	
B: Language Literature Society	
English A	110 pts
Mathematics A	110 pts
Civics A	90 pts
Sports and Health A	80 pts
Religion A	30 pts
General Science A	30 pts
Arts Activities	30 pts

B Vocational subjects in the Programme

Compulsory subjects
Basic Work Environment Knowledge
Basic Computer Science
Basic Business Economics
Business Economics Organization & Management
Health
Knowledge of Health Care
Basic Medical Knowledge
Medical Knowledge: Man Social and Cultural
Basic Health Care
Psychology
Basic Social Aspects of Health Care
Technology in Health Care, Nursing, or Dental Care
Knowledge of Dental Care

C Vocational subjects in the Programme branches

C1 Health Care

Compulsory subjects
Advanced Medical Knowledge
Basic Ethics
Advanced Health Care
Advanced Social Aspects of
Health Care

Electives
Foot Health Care
Health Care: Emergency
Health Care: Day Clinics
Health Care: Psychiatry
Health Care: Children and Youths
Rehabilitation
The Mentally Handicapped

C2 Dental Care

Compulsory subjects
Basic Dental Care
Basic Dental Nursing

Electives
Advanced Dental Care
Advanced Dental Nursing

Hotel and Catering Programme*

A Core subjects and compulsory subjects (in the order of value in study points):

Swedish	200 pts
A: Language and Mankind	
B: Language Literature Society	
English A	110 pts
Mathematics A	110 pts
Civics A	90 pts
Sports and Health A	80 pts
Religion A	30 pts
General Science A	30 pts
Arts Activities	30 pts

B Vocational subjects in the Programme

Compulsory subjects
Basic Work Environment Knowledge
Basic Computer Science
Basic Business Economics
Knowledge of Hotels
Basic Hygiene
Basic Foodstuffs
Material and Machinery: kitchen and waiting tables
Food Preparation: basic cold and hot dishes
Basic Nutrition
Basic Principles of Waiting Tables

Electives
Basic Electrical Safety
Business Economics Small Businesses
Hotel: Flowers and Decoration
Food Preparation: alcoholic beverages
Food Preparation: Gastronomy

C Vocational subjects in the Programme branches

C1 Hotel

Compulsory subjects
Advanced Hotel Operation
Hotel Equipment

Electives
Hotel Operation: Housekeeper
Hotel Operation: Conference
Hotel Operation: Reception
Tourism and Service

C2 Restaurant

Compulsory subjects
Advanced Hygiene
Advanced Foodstuffs
Food Prep: Catering
Food Prep: Restaurant Dishes
Advanced Nutrition
Advanced Waiting Tables

* Note that the above is mainly an overview of the subjects, not the actual courses offered, which are often more numerous

Electives
Food Prep: Special Diets
Food Prep: Advance Restaurant Dishes
Further Advanced Waiting Tables

C3 Catering

Compulsory subjects
Advanced Foodstuffs Hygiene
Advanced Foodstuffs
Food Prep: Catering
Food Prep: Basic Restaurant Dishes
Catering Production
Advanced Nutrition
Advanced Waiting Tables

Electives
Food Prep: Special Diets
Nutrition: Dietetics

Industry Programme*

A Core subjects and compulsory subjects (in the order of value in study points):

Swedish	200 pts
A: Language and Mankind	
B: Language Literature Society	
English A	110 pts
Mathematics A	110 pts
Civics A	90 pts
Sports and Health A	80 pts
Religion A	30 pts
General Science A	30 pts
Arts Activities	30 pts

B Vocational subjects in the Programme

Compulsory subjects
Basic Work Environment Knowledge
Basic Computer Science
Basic Business Economics
Basic Electrical Safety
Quality Techniques in Production
Basic Control Technology
Basic Maintenance

Electives (one subject at least must be studied)
Basic Workshop Techniques
Basic Technology

C Vocational subjects in the Programme branches

C1 Industry

Compulsory subjects
Production Technology
CAD/CAM Technology
Industry-Technology
Basic CNC Workshop Techniques

Electives
Electronics
Electrical Safety
Casting Technology
Model Techniques
Sheet Metal Technology
Control Technology
Welding Techniques
Maintenance Technology
Workshop Techniques
Tools

C2 Process

Compulsory subjects (not printing)
Basic Control Technology
Process Technology

Electives
Basic Foodstuffs Hygiene
Basic Knowledge of Foodstuffs
Process Techniques (pulp/paper, metal, casting, plastics, foodstuffs, chemical, etc.)
Screen/Printing Techniques

C3 Textiles & Garments

Compulsory subjects
Basic Technology: Textiles & Garments
Basic Materials

Electives
Leather Techniques
Tricot Techniques
Patterns and Grading
Computerized Pattern Handling
Drawing and Design
Textiles
Business Econ: Small Businesses
Trade and Marketing

C4 Wood

Compulsory subjects
Basic Wood Processes
Basic wood materials
Drying

Electives
Model Techniques
Sawmill Technology
CAD/CAM Techniques
Wood Furniture Techniques
Workshop Techniques

*Note that the above is mainly an overview of the subjects, not the actual courses offered, which are often more numerous

Media Programme*

A Core subjects and compulsory subjects (in the order of value in study points):

Swedish	200 pts
A: Language and Mankind	
B: Language Literature Society	
English A	110 pts
Mathematics A	110 pts
Civics A	90 pts
Sports and Health A	80 pts
Religion A	30 pts
General Science A	30 pts
Arts Activities	30 pts

B Vocational subjects in the Programme

Compulsory subjects
Basic Work Environment Knowledge
Basic Computer Science
Basic Business Economics
Knowledge of Media
Media Forms and Expressions
Media Techniques

Electives
Advanced Expo
Advanced Photographic Pictures
Advanced Graphic Reproduction
Advanced Graphic Form
Advanced Graphic Montage
Advanced Illustration
Advanced Sound Media
Advanced Media Communication
Advanced Moving Pictures
Advanced Screen Techniques
Advanced Text Production
Advanced Text Handling

C Vocational subjects in the Programme branches

C1 Information and Advertising

Compulsory subjects
Media Communication

Electives (in combination with advanced course above)
Printed Pictures and Text
Basic Expo
Basic Photographic Pictures
Basic Graphic Reproduction
Basic Graphic Form
Basic Graphic Montage
Basic Sound Media
Basic Moving Pictures
Basic Text Production
Basic Text Handling

C2 Printed Media

Compulsory subjects
Printed Pictures and Text

Electives (in combination with advanced course above)
Basic Expo
Basic Photographic Pictures
Basic Graphic Reproduction
Basic Graphic Form
Basic Graphic Montage
Basic Sound Media
Basic Media Communication
Basic Moving Pictures
Basic Text Production
Basic Text Handling

Natural Resources Programme*

A Core subjects and compulsory subjects (in the order of value in study points):

Swedish	200 pts
A: Language and Mankind	
B: Language Literature Society	
English A	110 pts
Mathematics A	110 pts
Civics A	90 pts
Sports and Health A	80 pts
Religion A	30 pts
General Science A	30 pts
Arts Activities	30 pts

B Vocational subjects in the Programme

Compulsory subjects
Basic Work Environment Knowledge
Basic Computer Science
Basic Business Economics
Basic Electrical Safety
Botany
Economizing in Food Preparation
Work Environments
Tools and Machines for Natural Resource Use
Knowledge of Nature and the Environment

Electives
Working in a Team
Animal Husbandry
Shipping Technology: Machinist Certificate
Shipping Technology: Master's Certificate
Buildings and Equipment
Vehicle Technology
Basic Heavy Vehicle Technology
Advanced Business Economics
Business Economics Small Businesses
Trade: Sales and Service
Earth Science
Natural Resource Production:
Gardens, Fishery, Greenhouse, Ecological Cultivation, Transport, Pigs, Cattle, Golf Course Care, Floriculture, Dairy, Timber, etc.
Natural Resource Techniques:
Repairs, Greenhouse Techniques, Machine Operation

* Note that the above is mainly an overview of the subjects, not the actual courses offered, which are often more numerous

Advanced Knowledge of Nature and the Environment:
Fishery, Recycling and Composting, Microbiology and Genetics, Waterways, Wildlife Conservation
Welding Technology

Vehicle Programme*

A Core subjects and compulsory subjects (in the order of value in study points):

Swedish	200 pts
A: Language and Mankind	
B: Language Literature Society	
English A	110 pts
Mathematics A	110 pts
Civics A	90 pts
Sports and Health A	80 pts
Religion A	30 pts
General Science A	30 pts
Arts Activities	30 pts

B Vocational subjects in the Programme

Compulsory subjects
Basic Work Environment Knowledge
Basic Computer Science
Basic Business Economics
Basic Electrical Safety
Basic Vehicle Technology

C Vocational subjects in the Programme branches

C1 Aircraft Maintenance

Electives
Electricity: DC and 1-phase AC
Electronics
Electronic Systems
Basic Aircraft Technology
Combustion Motor Technology
Basic Fuselage
Basic Aircraft Control Systems

C2 Body Work

Electives
Vehicle Service and Maintenance
Body Work
Painting Techniques
Welding Techniques
Repair of Plastics

C3 Vehicles

Compulsory subjects
Vehicle Service and Maintenance Vehicle Electricity and Electronics
Body Work and Interior

Electives
Electronic Systems
Vehicle Technology
Basic Heavy Vehicles
Electric Vehicles
Combustion Motor Technology
Business Econ: small businesses
Trade: Sales and Service
Branch and Product Knowledge
Personal Sales Techniques
Chassis: Passenger Cars
Chassis: Heavy Vehicles
Air Conditioning Systems
Power Transmission Technology
Control Systems: Heavy Vehicles
Hydraulic Systems
Welding Techniques

C4 Transport

Compulsory subjects
Basic Heavy Vehicles

Electives
Construction Site Vehicles
Preparing Construction Site
Business Econ: Small Businesses
Transport Technology
Air Cargo
Timber Transports
Logistics
Tank and Bulk Transport
Sanitation Transport
Distribution Transport

Social Sciences Programme*

A Core subjects and compulsory subjects (in the order of value in study points):

Swedish	200 pts
A: Language and Mankind	
B: Language Literature Society	
English A	110 pts
Mathematics A	110 pts
Civics A	90 pts
Sports and Health A	80 pts
Religion A	30 pts
General Science A	30 pts
Arts Activities	30 pts

B Compulsory subjects in the Programme:

Advanced English
Philosophy/Psychology
Basic History
Advanced Sports and Health
Advanced Mathematics
Advanced General Science
Religion
Foreign Language 2
Swedish

*Note that the above is mainly an overview of the subjects, not the actual courses offered, which are often more numerous

C Subjects in the Branches of the Programme:

C1 Economics

Compulsory subjects
Geography
Mathematics
Administration
Basic Word Processing
Basic Computer Science
Basic Business Economics
Advanced Business Economics
Basic Law

Electives
Foreign Language 3
Business Communication
Business Comm: English
Business Comm: French
Business Comm: Spanish
Business Comm: German
Advanced Word Processing
Business Econ: Small Businesses
International Business Economics
Marketing
Accounting and Taxation
Corporate Law

C2 Humanities

Subjects
Advanced History
Foreign Language 3
Latin + General Linguistics
Foreign Language 4
Civics
Advanced Studies: Humanities/Social Sciences

C3 Social Sciences

Subjects
Basic and Advanced Geography
Further Advanced Mathematics
Advanced History
Advanced Civics
Advanced Studies in the Humanities/Social Sciences

Science and Technology Programme*

A Core subjects and compulsory subjects (in the order of value in study points):

Swedish	200 pts
A: Language and Mankind	
B: Language Literature Society	
English A	110 pts
Mathematics A	110 pts
Civics A	90 pts
Sports and Health A	80 pts
Religion A	30 pts
General Science A	30 pts
Arts Activities	30 pts

B Compulsory subjects in the Programme:

Basic Biology
English
Physics
Basic History
Mathematics
Advanced Mathematics
Environmental Science
Foreign Language 2
Basic Technology

C Subjects in the Branches of the Programme:

C1 Science

Subjects
Advanced Biology
Philosophy
Advanced Sports and Health
Advanced Chemistry
Psychology

C2 Technology

Subjects
Advanced Technology
Further Advanced Technology

* Note that the above is mainly an overview of the subjects, not the actual courses offered, which are often more numerous

Appendix II: Vehicle Programme Specification

Required study points: 2,400 points of which 1,370 points in vocational subjects

A Core subjects and compulsory subjects
(in the order of value in study points):

Subject	*Course*	*Points*
Swedish	A: Language and Mankind	80
	B: Language - Literature - Society	120
English	English A	110
Mathematics	Mathematics A	110
Civics	Civics A	90
Sports and Health	Sports and Health A	80
Religion	Religion A	30
Science	General Science A	30
Arts Activities	Arts Activities	30

B Vocational courses within the Programme:

Compulsory Subjects

Subject	*Course*	*Points*
Work environment knowledge	Work environment - working life	30
Computer Science	Basic Computer Science	30
Electrical Knowledge	Basic Electrical Safety	30
Vehicle Technology	Basic Vehicle Technology	110
Business Economics	Business Economics A	30

C Vocational subjects within the Branches of the Programme:

C1 Branch: Aircraft technology

Electives

Subject	*Course*	*Points*
Electrical Knowledge	D.C. + 1-phase A.C.	90
Electronics	Basic Electronics	40
	Digital Technology	50
Electronic Systems	Flight Avionics	70
	Flight Avionics - Service and Maintenance	90
Aircraft Technology	Aircraft Technology - Basics	90
	Airplanes and Helicopters - Service and Maintenance	120
	Flight Systems Technology	155
Combustion Engine Tech.	Aircraft Engines - Basics	90
	Aircraft Engines - Pistons and gas turbine	140
	Aircraft Engines - Service and Maintenance	90
Body and Fuselage	Aircraft - Basics	
	Aircraft Technical Maintenance	120
Control Systems	Aircraft Electrical Systems	120

C2 Branch: Bodywork

Electives

Subject	*Course*	*Points*
Vehicle Technology	Vehicle Service and Maintenance	100
Body	Body and Interior	90
	Body Designs	70
	Jointing Techniques	200
	Damage Inspection	50
	Alignment Bench Techniques	370
	Alignment Techniques - Basics	60
	Alignment Techniques	130
Painting Techniques	Spray-painting - lacquering	175
	Repair of Plastics	100
	Science of Colour and Nuances	75
	Vehicle Painting - Basics	120
	Vehicle Painting	275
	Painting - Heavy Vehicles	150
	Painting Systems	270
	Lettering and Stencilling	30
Welding Technology	Welding Techniques - Auto Repair	150

C3 Branch: Vehicle Technology

Compulsory Subjects

Subject	*Course*	*Points*
Vehicle Technology	Vehicle Service and Maintenance	100
	Vehicle Electricity and Electronics	160
Body	Body and Interior	90

Electives

Subject	*Course*	*Points*
Electronic Systems	Installation: Antenna, Mobile Telephone, Communication Radio	30
Vehicle Technology	Passenger Cars - Basics	160
	Heavy Vehicles - Basics	90
	Electric Vehicles	40
	Small Machines - Care and Maintenance	30
	Vehicle Inspection	60
Combustion Engines	Otto Cycle Engine	160
	Diesel Engines	160
	Otto Cycle Engine - System Technology	130
	Diesel Engine - System Technology	80
Business Economics	Bus. Econ. for Small Businesses	60
Trade and Commerce	Sales and Service	60
	Branch and Product Knowledge	60
	Personal Salesmanship	60
Body	Chassis Components - passenger cars	120
	Chassis Components - heavy vehicles	110
	Air Conditioning Systems	60
Power Transmission	Driveline - passenger cars	140
	Driveline - heavy vehicles	190
Control Systems	Brakes and auxiliary systems - heavy vehicles	190
	Hydraulic Systems - heavy vehicles	190
	Hydraulic Brake Systems	160
Welding Technology	Arc Welding - heavy vehicles	40
	Flash Welding - Basics	40

C4 Branch: Transport

Compulsory Subjects

Subject	*Course*	*Points*
Vocational Technology	Heavy Vehicles - Basics	90

Electives

Subject	*Course*	*Points*
Construction Site Machines	Excavator and Power Loader	250
	Wheel-mounted Loader - site	100
	Wheel-mounted Loader - handling	65
	Mobile Crane	220
	Telescope Loader	190
	Road Grader	290
Vocational Techniques	Earth and Site Preparation	50
Business Economics	Business Economics for Small Businesses	60
Transport Techniques	Construction Site Transport	190
	Sanitation Transport	90
	Distribution Transport	190
	Airline Goods	80
	Vehicle Combinations	80
	Handling Goods	90
	Logistics	80
	Forestry Transport	120
	Tank and Bulk Transport	100
	Transport Vehicles - Basics	90
	Fork-lift Truck	