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5. TECHNOLOGY EDUCATION IN GENERAL EDUCATION IN FINLAND

INTRODUCTION

Teaching practical skills and technology in general education occurred in central Europe as early as the seventeenth century as ‘education for work’, providing skills necessary to society. These techniques were first introduced in Finnish schools at the end of the nineteenth century as ‘handicraft education’, which involved using materials and skills to produce objects and artefacts. At the same time, the student learned how to ‘work according to the rules’ and developed various skills needed for working life. Such ‘handicraft education’ combines carefulness and perseverance, with consequential development of the whole personality.

Traditionally, handicrafts have existed in the curriculum in Finnish schools from its inception in 1866. The subject usually concentrates on copying traditional handicraft objects, albeit with some scope for incorporating pupils’ own designs. At present, some schools offer effective and up-to-date technology education in the more modern sense of the word.

Changes in schools are usually quite slow; indeed, without specific incentives to accelerate development or reform of the school curriculum, proposed changes may take decades to implement. There are, however, exceptions. For example, the ‘civic school’ was created in the 1950s when Finland had to rapidly develop and diversify its industry. In addition to general education, schools needed to provide vocational training and plenty of practical education in the curriculum. At that time, the network of vocational institutions was far from comprehensive and there was a need for entrepreneurial skills. The civic school was able to develop these quickly and effectively.

Motivating pupils to keep their options open with regard to pursuing technology in further studies is mostly the task of the comprehensive and upper secondary schools. These schools need to pay particular attention to developing practical-technological education. In addition, education needs to be sufficiently versatile and flexible in order to cope with the changing industrial structure of the country. Modern technology is needed in more and more vocational branches in order to ensure the technological growth of the country. It is also needed at home. If a nation wishes to grow then it must invest in education, plan ahead, and support new technology in the general school curriculum.

While most Finnish homes and citizens use mobile phones and have access to the Internet, few teachers use these in education and it has been estimated that about half of the unemployed are ‘computer-illiterate’, lacking even basic computing skills. It has been said that we are governed by ‘techno bureaucracy’, which is trying to generalise the use of new communication gadgets only. This criticism also applies to general education. Medical science is developing machines that can crawl through the veins. Yet after four decades of human space travel, the practical-technological education at schools is often still limited to crocheting and woodwork.

The effort to help individuals understand new technologies and thereby exercise greater control over their environments is one of the aims of technology education. Another important aim, of course, which has recently received a great deal of publicity, is the realisation of equal opportunities.

CHANGING SKILL DEMANDS

The school as an educational institution has always responded to the challenge of society to teach the appreciation of technology. Originally introduced as handicraft education, technology education has been developed and enhanced to take into account societal needs. These needs change rapidly, however, in step with progress in technology. In Finnish schools, the different categories of practical technological education – handicraft, ‘sloyd’, and ‘technical work’ – have traditionally represented the disciplines responsible for education for work, techniques, and technology.

Technological education began as handicraft education around the world, with Finland being the first country in which it was accepted as a compulsory school subject (Cygnaeus, 1866). Accordingly, the school should above all lead through work to work. Handicraft at that stage was connected with self-supporting agriculture. Such do-it-yourself skills continue to be part of the Finnish style of life. The school programme offered starting points at many levels, for example, even if the projects were quite vocational and connected with working life, handicrafts should serve in character building and development of the whole personality (e.g., accuracy, carefulness, and persistence in work). Such handicraft education, as outlined by Cygnaeus, formed an early model for many countries (e.g., the Nordic Countries, England, and the United States, the latter through Otto Salomon, the Swede).

In the international educational literature, handicrafts refer to reproduction and imitative making. With the development of technology, handicrafts no longer provided sufficient guidelines for practical technological education. When machining and other such techniques became more generally used in production, the importance of handicraft skills diminished. Production processes were rationalised and standards regulating the production were made. Industrial production and patent systems were generalised. Knowledge about how to produce was separated from production skills; the former developed in the form of engineering skills, the latter as manual making. The general interpretation of handicrafts as ‘non-academic’ probably emerged from this background, the main function of such works being to satisfy industrial needs. On the other hand, development of technology led to the need to apply science with handicraft skills and education systems began to include ‘industrial arts’ – officially incorporated in Finland in the 1920s–1970s in the civic school, the task of which was prevocational and vocational and which created the basis for national industrial development and entrepreneurship.

‘Technology education’, in the latest global evolution of practical technological education, often refers to education emphasising new technology. However, the new title of the subject was first launched in the world, as far as we know, by Uno Cygnaeus when planning Finnish teacher training programmes (Cygnaeus, 1861).

The formerly-taught ‘work skills’ are insufficient in modern working life. However, when we do not know exactly what kind of technical demands future industry will place on technology, the challenge must be met by emphasising the important mental processes involved in the development of technology – work tasks will be more and more based on knowledge and theoretical governance of work. The status of creativity will be increased and broad abilities become more important. The new technological world demands more effective, but less academic skills, than school currently focus on. Technological changes also mean that a greater focus is