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Abstract: This chapter is concerned with how supranational educational policies in Europe were devised in the context of the emergence of new information technologies. By the 1970s, the heads of state and government of the European Communities (EC) had recognized the potential of new information technologies as a major source of economic growth and social development – and a crucial factor for the competitiveness of European industries in the world market. However, the wider social consequences and changes in skills and knowledge that the use of new technologies required were still largely unknown. The EC took on the role of a passive coordinator rather than of a proactive pacemaker in the European response to digital change. Only by the mid-1980s was this approach expanded to include the launch of several mobility initiatives in education, such as COMETT and ERASMUS. These initiatives fostered the exchange of skilled talents and created a common European sphere of education and training that could respond to the new skill demands in the context of digital change.

Keywords: history of education; policy analysis; vocational education and training; continuing education; VET and the labour market

Introduction

In today’s debates on digital change, it is often forgotten that in Europe there were already disputes in the late 1970s about how to deal with the emergence of the so-called “new information technologies”. This discussion began with the broader application of electronic computing in public administration, private industry, and

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service companies in the post-war decades.\textsuperscript{1} It became more intense with the advent of the personal computer in the late 1970s and continued after the 1990s. The implications of technological change for vocational education and training played a major role in these debates.\textsuperscript{2} Crucial questions regarding information technologies were how the required skills could be produced and which changes in the established skill formation systems were necessary.\textsuperscript{3}

This chapter is concerned with the education and training policies devised by the European Community (EC) in response to perceived challenges posed by technological change between 1970 and 2000. It is based on previous comparative studies of the various action programmes in the EC since the 1970s. In our analysis, we take on a historical perspective that interprets educational change within the framework of technology and economic policy. We demonstrate how the new technology-oriented competitiveness agenda of the EC served as a catalyst to change the overall educational governance. The specific context given the greatest attention here is on the emergence of new information technologies viewed as an economic challenge and an opportunity.

The consequences of the new information technologies for educational governance, especially “datafication”, “commercialization”, and “digital governance”, play an increasing role in policy processes, according to recent scholarship within policy sociology.\textsuperscript{4} Methodologically, the text follows this line. In this study, however,

\begin{enumerate}
\item Thomas Haigh, “Introducing the Early Digital,” in Exploring the Early Digital, ed. Thomas Haigh (Cham: Springer International Publishing), 1–18.
greater attention is paid to the historical conditions of “policymaking” than is usual in mainstream policy sociology. Policy documents of various actors at the European level serve as source material.

We begin by introducing the analytical concepts that inform the analysis. The so-called “digital society” emerges with the broad implementation of microchip-based technologies. It is characterized by the alternation of innovation and re-stabilization. In this context, the attribute “digital” was used increasingly to describe the specifics of contemporary societies. We use the concept of “technologies” to refer primarily to the so-called “new information technologies”, especially the personal or microcomputer, but also on the increasing possibilities of computer use in industrial production and electronic data processing.

In this chapter, we focus on political “initiatives”. Initiatives are time-limited packages of measures which political actors frame as a response to a perceived or conjured urgent economic, social, or technological challenge. They usually have a defined target group, use defined instruments, have a budget, and aim to change schooling, education, or training in a specific area of the education system. In contrast to laws, however, they are not aimed at the long-term structuring of the education system. Rather, initiatives are intended either to test new approaches, (i.e., pilot projects) or to prompt certain developments. Finally, the term “skills” refers to know-how, learned behaviour and attitudes in demand by the private economic sector. The understanding of skills is therefore rather broad in the following. This allows us to grasp the broad use of the concept of skills by historical actors. Research has shown how “narrow job-specific skills” have been challenged by the advent of new information technologies, and in this context a trend “toward broader, more analytical general skills, but also a move from hierarchically fixed

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activities to autonomous work in processual and cooperative work settings” can be observed.9

After a discussion of the methodological approach and overview on previous research, the first step will be to trace the economic situation in Europe after the first oil crisis and to show how education policy reacted to it. Second, we trace the educational programmes established to counter the crisis and examine the intended role for initial and continuing vocational education and training. In the concluding section, we present the central findings with reference to existing literature on the development of education and training in the last decades of the 20th century, and the emergence of the lifelong learning paradigm.

State of Research

Whilst the advent of a European dimension in vocational education and training until 2000 is already well researched,10 the economic context of many EC programmes has so far been neglected. Nevertheless, these earlier studies offer a framework for the present analysis.

In comparative VET research, the development of political competencies of European institutions has been studied, including its legal aspects. In a literature review, Ertl11 traced how VET policies in the EC were understood from the beginning as a means of economic integration. In the first decades, the educational policy of the European institutions was purely economically motivated. Sellin12 has pointed out that, until the mid-1970s, only one EC programme was concerned with vocational education and training. Not until the first oil crisis did European institutions begin to focus more on education policy measures with a whole cascade of initia-

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11 Hubert Ertl, The role of EU programmes and approaches to modularisation in vocational education: fragmentation or integration? (München: Herbert Utz Verlag, 2002).
tives. With the Maastricht Treaty (1992), compulsory education was, for the first time, brought into the European framework. However, Balzer and Rusconi or Trampusch do not recognize a critical juncture in European educational governance until after the Lisbon Summit 2000.

Recent research on the history of the European Communities has addressed the problem that historical contexts in which European actors made decisions have often been neglected. Although education remained the responsibility of the individual countries, the conditions for greater cooperation between the member states were created in the early 1970s. Paoli argues that until the 1980s, vocational training policy at supranational level pursued primarily social objectives. This argument coincides with Guy Neave’s view that from the late 1970s, the dominant policy mechanism in Europe was to bring together education, training, and the labor market, a strategy accentuated by the advent of new technologies. However, he claims that although employment and social policy were the immediate setting in which education and training services operated, they were part of the more complex issue of the viability of the Communities in face of the challenges in high technology that foreign competition brought.

Paoli²¹ identifies a shift in the mid-1980s towards economic competitiveness. He distinguishes a social democratic phase from a neoliberal phase and points out how economic representatives played a decisive role in these decisions. Calligaro and Patel,²² on the other hand, have pointed out in their analysis of European cultural policy, that the Cold War should also be considered as an important context for historical developments. Using audio-visual policies as an example, they trace how, in the 1980s, the question of competitiveness vis-à-vis Japan and the USA also began to play a greater role. This argument is important in the present historical analysis of the political reactions to the advent of new information technologies.

Although challenges posed by technological change are often mentioned in historical research and are directly related to the shift in the 1980s, the role these changes played for vocational education and training policies remains unclear. The same applies to historical studies on the paradigm of lifelong learning, in which the 1980s appear either as a period of “decreasing interest”²³ or as a “formative period for the neo-liberal lifelong learning discourse”.²⁴

This chapter builds on the aforementioned research but asks more precisely what role technology oriented economic policies have played for European education and vocational training policies. We assume that since the oil crises there has been a significant redefinition of educational governance. The competitiveness agenda of the European states played a central role in this. The advent of microchip-based technologies seemed to pose challenges to European economies that needed to be addressed through education policy. This then opened the door in the 1980s for a broader transformation of European education policy, which henceforth became more interventionist, but had to resort to soft policy approaches such as mobility programmes. It simply lacked the competencies for more far-reaching measures. However, it gradually broadened the understanding of its remit. In the

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1980s, the Lifelong Learning Agenda was already on the horizon, and it was to dominate debates and measures in the 1990s.

Methodology and Sources

This article focuses on European policies and governance regimes in the context of technological change. However, in contrast to sociological policy research, the analysis here is undertaken from a historical perspective to bring developments over time into focus. Lowe has pointed out three aspects that must be considered in order to understand the historical genesis of educational policies. First, the political system in which the policies are created and reformed must be considered. Second, the specific economic and social contexts of the policy reforms must be included in the analysis. The prevailing conditions of a society (e.g., the state of its labor market and economy, or its social order) inform the function of certain educational policies and thus are essential elements that need to be considered. Third, it is important to consider how powerful the policies under study could be in a given context.

The policies and governance regimes examined here are located at a supranational level. According to Lowe, there is a multi-faceted European network of national, supranational, and transnational actors or organizations. As the regulatory competence of the European institutions is limited, the power remains with the nation states.

The sources for this analysis consist mainly of publications and written interventions from the various players in European VET governance. The EUR-Lex database was consulted for the official announcements. Publications relating to individual initiatives and general developments stored in the Archive of European Integration (AEI) and the Publications Office of the European Union were also accessed in order to analyze the shifts in understanding of vocational education and training, and the emergence of the lifelong learning paradigm. Furthermore, different periodicals such as the *European Journal of Vocational Training* from the European Centre for the Development of Vocational Training were evaluated to obtain further contextual information.


Building the Technological Community

Fear of American or Japanese competitors, and later also of the so-called ‘Asian Tiger’ states, led to numerous European technology policy initiatives, and resulted in increasing implications for education and training. In the development and application of microchip-based technologies, the USA and Japan seemed much further ahead compared to the highly industrialized countries in Europe. While the UK was the European leader in electronic mainframe computers after the Second World War, British IT companies were increasingly unable to keep pace with their American competitors. Even their own public administration no longer wanted the products of the state-controlled computer firms. The problem of a shortage of skilled workers, which arose partly because the vast number of women in the computer sector was not considered, further exacerbated this issue.\(^\text{27}\)

As early as the mid-1960s, the large and efficient American companies were considered a central threat to European economies. In this context, the computer and high-technology industry was one of the sectors believed to be particularly threatened. This initiated a change in Europe towards an active supranational industrial policy. However, between the strong industrialized countries – and within these states – the ideas about the right way of implementation diverged widely. The first attempts at an ambitious European industrial policy failed since the nation states were not prepared to give the European Commission more powers. Although intergovernmental cooperation or programmes for declining industries were established, no future-oriented European industrial policy was developed. What prevailed was the impression that there was an economic threat from strong economies outside Europe.\(^\text{28}\)

This changed fundamentally in the wake of the 1970s crises. The end of Bretton Woods and the global oil crisis of 1973 marked an abrupt end to the decades of post-war boom in Europe.\(^\text{29}\) In this context, the reference to the threat of international economic competition was deliberately used to call for and legitimize the use of state funds to promote the industry, and later also to support broad-


based computer education programmes. It was primarily information technology companies themselves who demanded for more direct state investment. Their request was not simply a regulatory framework for free competition. Rather, the large companies demanded direct support for the computer industry in order to be able to keep up with international competitors. While in the 1960s expectations were still clearly directed at the national government, the focus now shifted to a European level. The ideal of a free-market economy was partially abandoned by the companies, at least for microelectronics, in favor of an interventionist industrial policy.\(^3\)

The companies were well-networked on a European level, but the new developments meant that many companies no longer felt represented at the European level by the established industry associations. The European Round Table of Industrialists (ERT), founded in 1983,\(^3\) was central to the development of the European Single Market policy. Since the mid-1980s, this advocacy group turned its attention to problems of higher education, and in 1987 established a Standing Working Group on Education.\(^3\) At the same time, the European Commissioner for Industry, Etienne Davignon, launched an IT business gathering, which became the European Information Technology Industry Round Table (EITIRT) in 1987.

The demands of the IT industry sector made the interventionist policy possible. For the IT sector, private investment in research and development was considered particularly risky and success would only be seen in the long term. National markets and a high degree of fragmentation were regarded as a further obstacle to the emergence of large, competitive players in the private sector. The first step towards a technological community was the European Strategic Programme on Research in Information Technology (ESPRIT), which originated in 1979 and was launched in 1984 after an initial pilot phase.\(^3\)

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\(^3\) Edgar Grande and Jürgen Häusler, *Industrieforschung und Forschungspolitik: staatliche Steuerungspotenziale in der Informationstechnik* (Frankfurt am Main: Campus, 1994).


Uncertain Skills Demands

Warlouzet³⁴ distinguishes three different political responses to the crisis of the 1970s: a “socially oriented” approach, primarily concerned with disadvantaged groups, a “neomercantilism” approach, focused on protecting one’s own companies and increasing the productivity of the economy, and “market-oriented” public policies, aimed primarily at releasing physical, financial, and human capital. In the area of educational policies, however, these different approaches were intertwined.

The following section will show how different initiatives were primarily based on an economic agenda aimed at strengthening competitiveness. Even if social, educational, or even cultural aspects played a role in the policy debates that led to several action programmes, the initiatives in the area of vocational training were clearly aimed at strengthening companies in the field of new information technologies. However, this was by no means accompanied by a clear vision of the skills that would be needed to meet the new challenges. The strategy of the Community in the early 1980s was exploratory in terms of skill formation. The priority was to “adapt the whole of society to the new tools”, which would be accomplished by analyzing future needs, adapting workers to the new technologies, promoting exchange of experiences among schools, and organizing forums and seminars featuring firms and trade union leaders.³⁵

In the 1980s and 1990s, the focus was on fundamentally questioning the conventional understanding of vocational education and training, and the relationship between the different areas of the education system. In practical terms, this meant more flexibility and the removal of boundaries instead of clearly tailored competence profiles.

The question of the effects of technological change on vocational training and the production of the required skills accompanied the new European technology policy agenda throughout the 1980s. In the first report of the European Commission, which was approved in 1979,³⁶ new information technologies were seen as part of industrial policy, and vocational training as “the key to society’s adaptability”. In addition to identifying the skills needed, a proposed programme allowed for the exchange of experience in knowledge transfer at all levels and in all aspects of education, including compulsory education.

With an uncertain future, it was difficult to find concrete solutions. As a rule, the European initiatives were not geared to specific skills. Rather, the aim was to provide impulses so that the required training regimes would somehow set themselves up automatically. The flexibilization of established vocational education and training, the promotion of cooperation between public and private actors, and a lifelong learning agenda replaced a more concrete educational policy.

On 19 September 1983, the Council and Ministers of Education meeting within the Council adopted a resolution which entailed a series of measures relating to the introduction of new information technologies in education. This provided the basis for Community action aimed at supporting and supplementing initiatives in education taken by different Member States. The Commission of the EC thus had a mandate to intervene in all three areas of general, vocational, and higher education to complement the actions taken in industrial policy and R&D with measures to address the social implications of technological change. The Council’s resolution stated the need to “[...] familiarize young people with new information technology in order to provide better chances for future generations. Teaching in this field must introduce pupils to the practical use of new information technology and provide them with a basic understanding of the operation, the possible applications and the limitations of such technology”.

With regard to the important role of education in mastering technological, social, and cultural changes and the anticipated significant influence that new information technology would have on all aspects of working and private life, the Council of the EC argued the need that “young people be taught not only the use of information technology as a tool but also to judge its effects on everyday life and its social significance”.

These measures related to the introduction of new information technologies in education and vocational training. Alongside the concurrent preparation of the EC’s mobility programmes COMETT and ERASMUS, these programmes were situated within the framework of the creation of the European Single Market. The ‘European Dimension of Education’, a concept coined in a resolution from 1988, aimed at guaranteeing the participation of Europeans in protecting democratic and social justice principles. Additionally, this concept emphasized the participation of learners in the economic and social development of Europe, and in turn, the preparation of a highly skilled workforce to fulfill the demands of the economy. The vocational policy followed in this period was based on the concept of Education-Training-Employment that promoted the development of Europe’s human resour-

ces, which, as shown above, meant preparing Europeans for a work life involving new information technology.

**Pushing Boundaries and Moving People: From Passive to Active Coordination**

In November 1979, the Commission of the EC published a position paper titled “European Society faced with the Challenge of New Information Technologies: A Community Response”, in which it delineated its strategy for social and education policy in response to technological change in Europe. The paper argued for the need to develop a social policy strategy to prepare the climate for innovation via three combined approaches. First, by undertaking studies on the impact of new technologies on employment, second, by exploring measures together with social partners to ensure that innovation is introduced in an acceptable way, and third, by establishing education and training programmes in schools and industry to reinforce the efforts of Member States. However, in the paper, the Commission also affirmed its standpoint that a community approach to the challenge of new information technology did not require the creation of new financial instruments. Rather, the EC’s role would be to “mobilize and coordinate the efforts made by Member States and by specialized international agencies within a wider framework”.

On 20 May 1980, the Commission of the EC requested the Economic and Social Committee’s (ESC) opinion on said document. The ESC warned that the exploitation of new information technology offered enormous scope for economic progress but could also be accompanied by unforeseeable social repercussions. The ESC voiced concerns over the potential social consequences of the development and application of new information technology in all areas of social and economic life that might even be more far-reaching than the expected economic benefits. The ESC also criticized the Commission’s tentative approach and the proposed community response as insufficient, pointing out the lack of plans and funds to counter possible negative effects.

Whereas the ESC had identified the improvement and reorientation of education and vocational training as a priority in the response to technological change, the Commission of the EC decided to wait and first consult the educational author-

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40 Brine, “Educational and Vocational Policy”.
41 COM/79/650 final.
42 COM/79/650 final, 5.
43 R/CES/720/80, 5.
ities of the Member States before developing its own propositions regarding future activities. The Commission had noted that several Member States had already proposed education reforms at all levels of the education system. They were in the process of developing their own concepts to revise or newly implement curricula in initial vocational education and training, continuing education for qualified technicians, as well as to incorporate the teaching of a basic knowledge about new technologies into mandatory schooling. However, the Commission had no oversight over the scope and details of such activities in the individual Member States. By putting itself in a primarily coordinating role, the Commission was able to draw on individual Member States’ experiences. On the downside, this approach meant that Community efforts would depend heavily on the Member States’ political will to abolish barriers, as well as to launch, coordinate, and fund their own aid programmes to promote the introduction of new information technology into education. In particular, the ESC highlighted the fact that the actions proposed by the Commission consisted merely in a coordination of efforts and did not entail the deployment of any financial means by the Community, which may not be enough to reach the envisaged effects.

The EC’s work programme for 1985–87 regarding the use of new information technology in general schooling consisted primarily in the support of studies and pilot projects undertaken in the Member States, as well as the organization of seminars to exchange and discuss information and experiences. A number of studies had already been conducted in the first half of the 1980s on different approaches to computer education in secondary schools in several Member States and on the use of new information technology to facilitate the education of handicapped children. The Commission of the EC also proposed to support experiments and actions aimed at increasing opportunities for girls to gain access to teaching related to new information technology in cooperation with the Advisory Committee on equality of opportunity. In the field of teacher training, the Commission proposed the organization of exchanges and study visits for teacher trainers and “multipliers” with the aim of establishing common guidelines for the content of teacher training in the field of new information technology. An initial series of such exchanges and study visits to France and the UK already took place in 1984–85.

44 COM/81/578 final.
45 R/CES/720/80, 3.
46 COM/84/722 final.
47 COM/84/722 final, 3–4.
48 COM/84/722 final, 9.
49 COM/84/722 final, 8.
50 COM/84/722 final, 11–13.
With regard to the development and use of appropriate software, courseware and hardware systems for schools, the work programme envisioned a series of roundtables and symposia to stimulate collaboration between education authorities and industry at Community level, as well as the launching of a series of projects on Community level, with the Commission and industry sharing the costs for developing IT-based educational equipment. In the same vein, the EC Council decided in 1988 on an Exploratory Action on DELTA (Developing European Learning through Technology Advance) with an initial budget of 20 million ECU.\(^5\) DELTA was aimed at bringing together academia and industry for research on learning systems and the collaborative development of advanced learning technology. However, DELTA targeted continuing vocational education and higher education, whilst learning in schools was not of direct interest. DELTA had originated in the Directorate General XIII of the European Commission, which was responsible for research and development in the field of IT, telecommunications, and related technologies. Thus, it was essentially a technology focused R&D initiative.\(^5\)\(^2\)

With regard to the introduction of new information technology into European school systems, the EC essentially took on the role of supranational coordinator and provider of platforms for the gathering and exchange of information, experience and best practices based on projects undertaken and funded by the individual Member States. Rather than launching community projects on its own, the EC initiated the creation of a network of designated institutions in all Member States to coordinate research activities. The EURYCLEE network was set up in 1986 with the task to select, store, and exchange information relating to the introduction of new information technology into schools in the Member States. In addition, the EC sought out possibilities for cooperation with international organizations such as OECD (CERI in particular), Council of Europe, UNESCO, and the International Bureau of Informatics (IBI). The EC was interested in the participation in actions launched by these organizations, as well as in regular exchanges of information on the issue of new information technology in education.

By the early 1980s, the wider social consequences and changes in skills and knowledge that the use of new technologies required, as well as the benefits and constraints of using computers in the classroom were still largely unknown. Consequently, it also seemed unclear in what ways the systems of teaching and learning across Europe should be adapted to be able to realize the anticipated benefits from the use of new media in the education sector. The EC largely left it to the

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51 88/417/EEC.
Member States to take the initiative and develop their own concepts as to how their respective school systems should be responding to the challenges of new information technology, in what ways school curricula need to be adapted and what purpose the use of computers in general education should serve. Rather than launching its own initiatives, the EC’s strategy consisted mainly in mobilizing and coordinating the efforts made by Member States, by pooling studies on the impact of the introduction of new information technologies on the labor market and new demands for education and training systems.

In contrast to the earlier self-assigned role of a passive coordinator in the response to technological change with regard to general schooling, during the second half of the 1980s, the EC took on a more active role in promoting new information technology both in higher and vocational education, in particular through the launch of European exchange schemes. On the one hand, this pertained to the smaller-scale exchange and study visits for teacher trainers to broaden their practical and professional experience. On the other hand, it involved the launch of substantial mobility initiatives such as COMETT and ERASMUS with the aim of pooling resources for higher education or advanced training in new information technology across Europe.

A New Understanding of Education and Training Emerges

In an interview held in the early 1980s, the European Commissioner for Industrial Affairs and Energy Etienne Davignon described the issue of vocational training in the context of new information technologies as “a central problem” and announced various surveys to assess new skills required in industry. However, Davignon also announced that it could not just be a matter of defining specific skills that were now needed. Rather, the commissioner held out the prospect that the whole understanding of fixed occupational codes of conduct would have to change radically. As a direct result, he saw an urgent need for radical flexibility in vocational education and training. The new information technologies would be accompanied by an “occupational adaptation on an almost permanent basis”.

Within the limits of its legal framework, the European Commission therefore wanted to help manage both the economic and social consequences of technological change and, overall, ensure cultural adaptation to the new situation. “Informa-

tion, education, training and retraining" were the means to achieve this.\(^{54}\) In any case, the ultimate goal of the initiatives was to strengthen the competitiveness of the member states. All measures served this one purpose, following the conviction that social problems of the member states, such as high unemployment, would for the most part simply resolve themselves once this goal was achieved.\(^{55}\)

With regard to vocational education and training, two policy documents (both adopted in 1983) were central to the next steps.\(^{56}\) These were the “Council resolution concerning vocational training policies in the EC in the 1980s”\(^{57}\) and the “Council resolution concerning vocational training measures relating to new information technologies”.\(^{58}\) With regard to the challenges posed by technological change, it became clear how comprehensively they seemed to affect vocational education and training. Unemployed young people, workers with obsolete qualifications and women working in office jobs were identified to be particularly threatened by computer-aided rationalization. Each of these specific stakeholder groups appeared to require special attention. The Community’s medium-term programme 1986–1990 to promote equal opportunities for women, for instance, explicitly mentioned the advancement of women’s training for occupations connected with new technology as one of its goals.\(^{59}\) The new information technologies called into question the established system of coordinating the interests of state, capital, and labor.

Over the course of the 1980s, social issues were still meant to play a certain role in the new technology policy. However, the new situation called for a highly qualified workforce, which was now meant to be shaped by various European initiatives. With the advent of new information technologies, a different understanding of education and training prevailed. This culminated in a lifelong learning approach in the 1990s. The individual initiatives in the 1980s and 1990s were catalysts for these shifts towards a fluid, flexible, and institutionally ill-defined concept of vocational education and training.

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\(^{54}\) COM/1980/513 final, 3.


\(^{56}\) Clarke, “Competitiveness”.


\(^{59}\) COM (87) 155 final.
In preparing the initiatives, the Commission was advised by the Standing Committee on Employment and the Advisory Committee for Vocational Training. The need for information was also met by the European Centre for the Development of Vocational Training (CEDEFOP), founded in 1975. CEDEFOP had been installed to provide a better information base for the situation of vocational training in the member states, and now it also contributed to the question of how to deal with technological change. While the first studies, seminars and reports were primarily devoted to the social aspects of education policy, the context of an economy-oriented technology policy now became increasingly important for CEDEFOP. In 1980, a study was carried out in which documents were analysed and interviews were conducted with experts from the Organization for Economic Cooperation and Development (OECD) and the International Labor Organization (ILO), who were also heavily involved with the impact of technological change on the skills required. This was followed by isolated case studies in the member states to validate the results of this preparatory research. The European Foundation for Living and Working Conditions and the European Pool of Studies Analysis also contributed to the formulation of a new technology agenda.

CEDEFOP was now consolidating its previously rather uncoordinated events and surveys on the impact of technological change on VET. In the mid-1980s, it responded to the Commission’s requests to set up a proper observatory for vocational training. Vocational education and training created problems here, as access via the education system and via companies differed fundamentally and led to different results. CEDEFOP was able to gauge a fairly accurate picture of what the various initiatives were about. This put education and employment in a new, direct relationship and made the coupling of the two systems more flexible. The focus was on mobility, exchange, and formalization, not on defined skills. This was intended to meet the challenges posed by new information technologies.

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The first major European initiative to address technological change dealing with training issues was the “Community Programme for Education and Training in Technology” (COMETT). The aim of COMETT was to increase mobility and promote transnational cooperation. It was an initiative designed to facilitate the transfer of knowledge and experience between member countries, but also between the spheres of education, research, and business. As such, COMETT was not only meant to bring together schools and universities, but also to promote cooperation between publicly funded research institutions and private companies. Although it primarily targeted higher education, the initiative was meant to “reinforce training in technology (particularly advanced technology), increase the development of highly skilled human resources and the competitiveness of European industry”.

While COMETT was still very close to technology policy initiatives such as ESPRIT, the following programmes gradually moved away from this close connection. However, the central motivation behind their measures was not given up. In terms of financial volume, COMETT remained the largest educational initiative of the 1980s and 1990s. In the longer term, COMETT was only surpassed by the broader and much better-known mobility programme “European Community Action Scheme for the Mobility of University Students” (ERASMUS), which still exists in an adapted form and was launched shortly afterwards. While the programme’s name evokes the idea of traveling intellectuals in line with the humanist tradition, ERASMUS served more mundane and pragmatic purposes. On the one hand, the mobility programme was intended to help instill a sense of European citizenship in youth, as a cultural educational contribution in the effort to create a single European market. On the other hand, ERASMUS served to create a common pool of higher education resources among member states for the training of a mobile, highly skilled workforce that the European economy needed to keep with technological change. In 1988, the “Action programme for the vocational training of young people and their preparation for adult and working life” (PETRA) was launched to modernize vocational education and training, and to respond explicitly to technological change. In 1990, the smaller “Action programme to promote innovation in the field of vocational training resulting from technological change in the European Community” (EUROTECNET) was set up, which even had the technology policy thrust into its name. The “Action programme for the development of continuing

vocational training in the European Community” (FORCE), aimed at the vocational learning of adults, ran in parallel.\textsuperscript{66}

The aim of PETRA was to ensure that young people in all member states received at least one year of vocational training after compulsory education. Like the other initiatives, the programme was intended to introduce a European dimension to vocational training. However, even this initiative had a specific function in the context of “rapid economic, technological and social change”\textsuperscript{67}: to create skills required in a digital society. FORCE and EUROTECHNET aimed to lead traditional vocational training into the future. This meant promoting innovative formats, placing greater emphasis on continuing vocational education and training, and developing an overall vision for a regime advocating flexible, dynamic, and transnational skill formation. This corresponded to a new meaning of industrial society, which was already understood as “information society”, in the report “European society faced with the challenge of new information technologies: a Community response”.\textsuperscript{68} The two initiatives targeting women’s education and training, the IRIS network, launched in 1988, and NOW (New Opportunities for Women), launched in 1991, can be seen as part of these series of efforts to create a pool of human resources geared with skills to face the technological society.\textsuperscript{69} However, it should be noted that IRIS did not fund training but functioned as a network of best practices. Out of the 330 projects carried out in 1991, only 6 were part of EUROTECHNET, and 5 members of the IRIS directory were also COMETT projects. This shows some overlap between women’s projects and the larger EC initiatives, but not at a significant level. In 1991, a preparation meeting between the twelve member states took place to draft their NOW projects. The topic of new technologies was considered a priority. The training of women in new technologies, however, decreased over the years leading to less emphasis on their contribution in a so-called information society. Consequently, this entailed a decline in the participation of women in technical areas.\textsuperscript{70}

\textsuperscript{66} COM/1993/151 final.
\textsuperscript{68} COM/1979/650 final.
\textsuperscript{69} PA Cambridge Economic Consultants limited, An Evaluation of the IRIS Network (Final Report) (Brussels: Commission of the European Communities, 1992).
\textsuperscript{70} See UK example in Jacky Brine, “The European Social Fund and the Vocational Training of Unemployed Women: questions of gendering and re-gendering,” Gender and Education 4, no. 1–2 (1992), 158.
In Search of Coherence

It was clear to contemporaries that the microchip presented a challenge. However, what remained unclear was the type of skills needed to cope with it. The dynamization and flexibilization of vocational education, the desire for high level of skills and the focus on continuing education and training were all partly framed as an attempt to meet new needs and challenges. These perspectives were then incorporated into a more coherent programme in the 1993 EC White Paper Growth, competitiveness, employment: The challenges and ways forward into the 21st century. Although the major argument for launching this report was the high rate of unemployment in Europe, the report built on the various measures and experiences of the 1980s. The programme outlined a tripartite approach to increasing employment: stimulating the market by creating the best legal conditions, investing in structural elements and activating the labor force. Vocational education and training were to play a central role here, as can been seen from the White Paper Teaching and Learning: Towards the Learning Society. Large sections of this document only integrated the approaches of the 1980s, yet it provided a conceptual framework for them. On the one hand, it adopted the diagnosis of information society that had already served as the framework for the new technology policy agenda since the late 1970s. On the other hand, the global dimension of the programme had now been adopted. However, the approaches in the 1980s had already been formulated in a transcontinental context, in which the USA and Japan were seen as the biggest competitors. Finally, the creation of scientific and technical skills was seen as a central problem for future-oriented vocational training. Mobility programmes and an extension of the meaning of vocational training and vocational skills remained central features of this accelerated programme “towards a learning society”. In parallel, all initiatives that were explicitly aimed at vocational training were brought together in the Leonardo da Vinci programme, which aimed at further consolidating the new European vocational training policy.

71 Jeff Kenner, EU employment law: from Rome to Amsterdam and beyond (Oxford: Hart, 2003), 296.
Conclusion

The greater the claim, the more unspecific the package of measures. The only thing that European policymakers took for granted was that things could not stay the way they were. In the aftermath of the two oil crises of the 1970s, European states and supranational institutions were deeply unsettled by their IT industry’s warning that they risked falling behind in the face of accelerating structural change. They developed new economic and educational approaches to meet changing demands and requirements. With the arrival of the personal computer in private households in the 1980s, it became clear to everyone that a new era had begun.75

However, since it was not clear which skills were actually needed in a dawning digital era, European education policy became both more ambitious and more unspecific. The European Year of Lifelong Learning (1996) celebrated this supposedly new approach.76 Although the idea of lifelong learning had already emerged under completely different economic and social conditions in the context of the post-war boom,77 it underwent a redefinition that took hold in the 1990s. The new information technologies seemed to make the necessity of this new policy immediately evident.

In 2010 the European Commission proposed a “Digital Agenda for Europe” as part of the “Europe 2020” programme, which can be interpreted as a direct continuation of the efforts of the 1980s. Once again, the aim was to strengthen the competitiveness and productivity of European companies.78 There was also a section of this agenda that explicitly focused on the lack of digital skills in Europe. The “New Skills Agenda for Europe” aimed for closer integration of education and private business, more student mobility, recognition, and validation of acquired competences and modernization of vocational and higher education.79

The relation between education and technology is a site of ongoing struggle, negotiation, and conflict.80 As the history of the European debates and initiatives regarding the introduction of new information technology into education indicates, there is certainly no easy way to deduct skill demands from technological

78 COM/2010/245.
79 COM/2016/381 final.
80 Neil Selwyn, Education and Technology Key Issues and Debates (London: Bloomsbury Academic, 2021), 188.
development alone, as the education for a digital society is necessarily intertwined with contested and value-laden ideas of what such a society entails and how it is organized. Moreover, the fast pace of technological change necessitates a constant re-evaluation of temporary conclusions. As such, it seems impossible to pin down a persistent set of skills that a future European workforce or citizenry requires. Instead, the European history of educational policymaking in face of technological change points to the efforts through which challenges were repeatedly reframed and educational policy responses sought and re-evaluated. The complex negotiation processes involved a wide range of stakeholders and target groups – from at-risk groups such as women and low-skilled workers, to a pool of highly qualified, mobile, and versatile workers that the EC’s mobility programmes hoped to create. Therefore, it cannot be expected that educational systems ever find a definitive answer to the question of how to respond to technological change. Instead, it is worthwhile to attend to the ongoing struggle between differing views about what challenges new information technology poses for education systems and how they should be appropriately addressed. With regards to Europe, this historical and current struggle relates to the shifting focus between economic concerns of global competitiveness on the one hand, and social policy and social justice issues on the other, including people who are displaced from the labor market, excluded from participation in educational opportunities, or otherwise disadvantaged by the rise of digital technologies.

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