

The History of Technical Education

A Short Introduction

Second Edition

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Introduction

I have undertaken to write a short history of technical education, with a particular emphasis on work-based education. Bearing in mind the current debates about the importance and position of vocational education within the overall education system I feel such an historical perspective could be useful for the following reasons:

- To date very little attention has been paid to the historical context of our current quandaries over technical education
- It will provide a host of insights into this country's current struggle to confront and tackle skills shortages and our ability to respond to and compete with the emerging global economies
- It will provide pointers to the lessons and strategies for technical education aimed at industrial growth which have been spelt out over the last 200+ years but which successive governments and educationalists have continued to neglect or discard.
- It will illustrate the extent of industrial decline in Britain over the past 150 years

Although I have written extensively about many of the issues that will inevitably be identified in these chapters I hope that the analysis will be both interesting and illuminating by providing additional information about this very important and yet neglected aspect of the educational system.

This introduction will set the scene and provide a backdrop for the later chapters, which will cover the various historical stages beginning before the Industrial Revolution up until the present period. One challenge when writing a history of technical education, say when compared with the history of other sectors of education, is the difficulty of getting hold of the existing literature which is both relatively sparse and little referenced - which again reflects the Cinderella image of the subject. Because of limitations of time and space I cannot hope to do full

justice to this complex and fascinating topic so the major focus will be on England. Wales, Scotland and Northern Ireland each merit their own histories reflecting as it were their own unique, fascinating and interesting past. England has never fully recognised the achievements and contributions that the other home countries have made to technical education preferring to look beyond our shores, particularly to America. This has been certainly true over the last couple of decades with the imitation of a number of work based models e.g. Training Enterprise Councils (TECs) which ultimately failed and again showed that the American system had little to offer. Interesting to note that Scotland and latterly Wales have for instance developed some very innovative programmes in vocational education and modular credit based systems which in many ways are more impressive than those in England.

Gradual decline

One irrefutable truth that history highlights is this country's gradual industrial decline since the heady days of the early to mid nineteenth century. One important factor contributing to this decline was the long time it took to realise and develop a national strategy for technical education and training and the resultant failure to establish a network of technical education institutions. This last point is particularly evident when one makes comparisons with other European countries since the beginning of the nineteenth century. For example France and Germany had already established technical universities in the early 1800s whilst little happened in England until the turn of the 20th century and then only to a limited extent. Cambridge, Oxford and the public schools continued to neglect science and technology providing instead a classical education. It was only after around 1860/70 that industrial cities like Birmingham, Manchester and London introduced

scientific and technical training supported by merchants, manufacturers and industrialists. France and Germany rapidly established technical education institutions including universities in order to develop people in higher-level technical skills and knowledge thus creating a population of technocrats who would lead on their countries' industrial developments and production. However it must be stressed that Scotland within the British context was an outstanding exception – but more of that later.

An historical perspective identifies a number of recurring critical factors that have blighted and slowed down the development of an effective national technical education system at all levels. Critical factors identified include:

- A philosophy of laissez-faire and the subsequent acquiescence into voluntarism across the field of technical education
- Preoccupation with educational elitism which always valued the academic over the practical subjects
- The urge to push practical subjects into an academic subject culture i.e. academic drift
- Neglect of vocational qualifications by successive governments and the majority of educationalists which reinforced the basic hostility about the validity and credibility of the more technical and practical aspects of the curriculum
- Arrogance and complacency by employers about international competition, particularly in the 19th century, which was largely engendered by the benefits of the empire and a false belief in the supremacy of their products
- The avoidance of warnings given by a succession of royal commissions, reports and influential individuals who had as early as 1851 highlighted future problems which in turn led to the failure to improve the situation.

These factors largely explain why such issues as the so-called academic/vocational divide and the value of parity of esteem between work-based and other qualifications still plague and dominant political and educational debates even today. Accepting that the relationship between education and industrial growth is a complex matter mainly because of the multitude of variables that are involved should not deter us from making the correlation between these two key parameters. A few writers (1) have considered the

relationship between technical education and industrial growth and the influence of the English culture. Bernal (2) brilliantly explores the subtle relationship between science, technology and industry during the 19th century which I will refer to in greater detail later.

English culture

Their analysis provides a fascinating insight into how English cultural elements influenced industrial and economic life arising from the class structure, which as we know has determined so much of English history. These writers have highlighted in particular the reaction, largely one of suspicion, of the upper classes to the consequences of the industrial revolution and the rise of the 'industrialist class.' Interesting to note also that much has been written about the destructiveness of the trade unions toward industrial progress but the so-called English elites have proved far more obstructive particularly during the critical and formative period of the industrial revolution. The book by Weiner brilliantly examines the economic decline and its interaction with social, political and psychological elements.

Britain's industrial decline was first identified following the Great Exhibitions of 1851 (London) and 1867 (Paris) when it became evident that the country was beginning to lag behind France, Germany and the US. Britain's primary energy strength namely coal as the symbol of her industrial might was not sufficient to keep her in the lead as a manufacturing nation. Our competitors had more quickly realised that investment in people as well as plant and machinery was equally important and this was apparent when comparing products at these great exhibitions. The quality and range of products from our competitors was superior to our own and reflected the beginning of our decline. In addition it must be noted that England was one of the few major competing countries that did not have an organised system of technical education. The decline accelerated during the latter part of the 19th century and throughout the 20th century as we lost the highly questionable benefits arising from the empire/commonwealth namely access to plentiful and cheap resources both human and materials and the protected and given markets for our own domestic manufactured products e.g. cars, motor cycles etc. Even with the clear advantages afforded by that fact we created the first industrial revolution - it was evident by the end of

the 19th century that our productivity was declining and we were losing our international market share in a wide range of products. Equally concerning was our failure to develop and exploit the newer technologies associated with chemical and electrical engineering. In addition the traditional industries like shipbuilding were failing to invest in research and development and replace machinery that had become dated and inefficient. One major disadvantage of being the first industrial country was that other nations could more quickly develop and introduce the newer industrial techniques and were able to invest in new plant and equipment.

One depressing and perplexing fact emerges from historical analysis is that even when the problems were identified no real action was taken to redeem the situation. Two typical quotes reflect the growing concerns about the quality and relevance of technical education:

“The excellence of the foreign goods is due, not to the workmen, but in great part to the superior training and attention to the general knowledge of their subject, observable among the managers and sub-officers of industry. No candid person can deny that they are far better educated, as a general rule, than those who hold similar posts in Britain” (Playfair 1867 after visiting the Paris Exhibition)

“...evidence appears to show that our industrial classes have not even that basis of sound general education on which alone technical education can rest.... our deficiency is not merely a deficiency in technical education but in general intelligence and unless we remedy this want we shall gradually but surely find our undeniable superiority in wealth...and vigour will not save us from decline”
(Schools Enquiry Royal Commission 1868)

Both of these quotations sadly reveal truths that are as valid today as when they were stated. These quotations were made at a time when there was still no national framework for technical education. In spite of some worthy attempts to develop technical education and instruction e.g. through the mechanics institutions movement progress was painfully slow and no real vision was created by the governments of the day and more depressingly most governments since.

The next chapter will begin with the period prior to the industrial revolution and highlight the influence and importance at that time of apprenticeships and the Guilds. The impact of the industrial revolution will then be explored with the transformations that it brought about as people moved into the rapidly developing industrial cities and workers' gained interest in understanding the science and technology that underpinned the industrial processes. Contributions were made by people like Birkbeck and others who realised the importance of a well-trained workforce which led to the creation of mechanics institutions. This was a period that promised much but sadly became a time of false dawns and missed opportunities.

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 - Weiner M. – *English Culture and the Decline of the Industrial Spirit*, CUP (1981)
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- (A more comprehensive book list is provided in Appendix 4)

From the Middle Ages to the 19th century

The introduction identified and provided a brief overview of the issues that have dominated and bedevilled technical education in England at a particularly significant period. As I have indicated this is a short history and as a result does not permit a detailed discussion of all home countries and beyond. I am acutely conscious of the developments that have occurred abroad both in technical and scientific discovery and the development of technical education and training. One only has to read the seminal works of Joseph Needham in regard to the science and technology of China and the Indian sub-continent to realise the significant contributions these civilisations made to these important bodies of knowledge. (Science and Civilisation in China, 20 volumes, CUP, 1954) One must also remember the massive contributions to mathematics, science and technology made by the Middle Eastern countries and cultures and the Greek and Roman empires.

Although there was a growing realisation in England of the practical benefits of science in the 17th century and a developing interest in its practical aspects later in the 18th century this did not lead to any provision or instruction in scientific and technical subjects until well into the 19th century. The excitement generated by the achievements of science highlighted the importance of communicating and disseminating information about science and its practical out workings. A number of organisations were established to disseminate useful knowledge including the Royal Society (1660), the Society of Arts in 1754/1755 for the encouragement of arts, manufacture and commerce; this later became the Royal Society of Arts (RSA). In 1810 the Royal Institution became a public body in order to promote chemical science, the arts, manufacturing and the diffusion and extension of useful knowledge in general. From around 1780s provision of science for adults was made by philosophical and literary institutes. However these organisations were very much focussed on

the middle and upper classes and were about the pursuit of knowledge as opposed to the practical aspects. Interesting even at this time to see that provision was already available for the elite and privileged and not for the mechanics and artisans. There is evidence that self-help groups did exist for some workers but not on any significant scale.

Before the age of mechanisation and the controlled exploitation of steam to drive machinery all artefacts were hand made. What machines existed exploited the elements e.g. wind and waterpower drove windmills and water wheels to grind corn and irrigate fields. What elementary machines existed were manual and were associated with rural cottage industries such as spinning and weaving. Goods were mostly made by hand and the techniques used handed down generation by generation. Agriculture was the main occupation and craftspeople worked alone or in small communities. In the time before the Industrial Revolution technical education was based on the apprenticeship system and largely managed by the Craft Guilds.

The Craft Guilds-Livery Companies (13th century to present)

The craft guilds reached their apogee of power and influence during the 13th and 14th centuries being solely responsible for the organisation of labour and the standards of the craft skills. The organisation of a guild was precisely defined into three hierarchical categories or classes: namely the livery, the freeman and the apprentice. At this time members of the guilds were exclusively male hence the following terminology. The liveries were people who had established businesses and it was from this category that the Master, the Wardens and the Court of Assistants were elected. They were totally responsible for the organisation and management of a particular guild including the setting of prices and wages.

The next category was the freemen who were bound absolutely to a guild and were referred to as the journeymen craftsmen. The final category comprised the apprentices or trainees who were bound or indentured to a master craftsman for seven years. The apprenticeships were overseen during this period by the Court who made certain the apprentice received effective training and was well treated. The apprentice at the end of his training was required to present his masterpiece to the Wardens this being a piece of work to justify that he had mastered his craft. The Guilds by maintaining high standards and wages limited any possible competition from beyond the City boundaries. Although the methods of the Guilds were often perceived as autocratic they established good standards at a time when England was a rural country comprising landowners, farmers, labourers, shopkeepers and craftsmen.

The Guilds were instrumental in creating the City and Guilds Institute of London following a government committee report about the need to promote the interests of several of the trades. These included such Companies as the Clothworkers, the Goldsmiths, the Fishmongers, Cutlers and the Carpenters.

The system worked well until the coming of steam power and factories that required a new set of methods of training as people migrated to the cities and away from rural communities. This transition highlighted the need to raise awareness of the application of scientific ideas to industry and as a result the rudimentary beginnings of vocational education.

(The Guilds continue today though they have become more diversified supporting their respective crafts and trades in a number of ways. The Worshipful Company of Goldsmiths, almost uniquely, continues to offer very high quality apprenticeship programmes where the apprentices are still managed by a master. Recently the City and Guilds Institute of London (CGLI) recognised the high standards set by the apprenticeship programme and the resulting artefacts by accrediting the Company for its Senior Awards).

The Mechanics Institutes (1800 to 1850)

The formation of the Mechanics Institute movement was in many ways the first attempt to create learning opportunities for the workers who had a desire to learn about the scientific and technical principles underpinning the processes they were using.

In the relatively short existence of the movement it highlighted a number of important issues that have continued to impede the development of technical education and training in England. Many of these obstacles can still be identified today namely lack of qualified teachers/instructors, weak literacy/ numeracy skills of the learners and the continuing negative perception of work - based education. However physical evidence of their existence continues even today as a number of colleges and universities can identify their beginning from a particular Mechanics Institute e.g. Huddersfield, Edinburgh, Liverpool, Keighley and other towns. Many of the institutes had their own libraries and workers could pursue specifically designed vocational courses by way of lectures and other programmes of study. George Birkbeck then Professor of Natural Philosophy at the Anderson Institution in Glasgow founded the movement in 1800. He began formal instruction for workmen and artisans in the scientific principles that were used in their trades. The workers paid a small fee to become members and attend the classes. Following his move to London other institutions were established throughout the country e.g. in 1824 institutes were established in a number of principal towns and cities including Aberdeen, Leeds, Lancaster and Newcastle and in 1825 in Manchester, Norwich, Birmingham and Devonport. As a result by 1850 around 610 institutes existed with a membership over 600,000. Birkbeck was supported by a number of far - thinking individuals who could see the importance of work-based education including Lord Brougham.

The following quote, which appeared in a Journal of Adult Education, reflects the zeal and commitment of the movement:

"The movement had genuine educational merits. It started from living interests. There has always been a strong strain of scientific curiosity amongst the English working classes, particularly in the North of England—The Mechanics Institutes aimed at satisfying the desire of workmen in an age of scientific triumphs to understand the secret of the new power which was revolutionising industry. They filled a gap for which there was no other provision"

Sadly in spite of the aspirations of the founders the Mechanics Institutes as a whole did not achieve a national critical mass in order to achieve a wider dissemination of scientific and technological knowledge as far as was hoped. In 1858 a report by a committee of the Society of the Arts stated that: "Mechanics

Institutes are no longer Institutions for mechanics; some enrol a small number of artisans, whilst others register none... though they are still called Mechanics Institutes, they are places for the resort of shop men and the middle class.” It would appear that the development had been pitched too high to achieve and sustain a lasting and widespread success. One major factor leading to their ultimate demise was the parlous level of state education even at the elementary stage. Other contributing factors included the limited amount of knowledge of the practical application of scientific principles, the proportion of knowledge that the artisans actually required in their work and the scarcity of industrial research at the time that would have greatly assisted the teaching of the applications of the concepts behind the processes. This further impeded the successful introduction of effective instruction. Therefore, in hindsight, it would be difficult to convey the technical and practical aspects until a more thorough understanding of the principles of industrial practice had been realised. In essence it was too early to reconcile theory and practice and relating and applying science to industrial practice. Also the lack of state funding and sustained political support contributed to the decline as often members’ subscriptions were insufficient to maintain the Institutions. After 1848 the educational work for the workers rapidly declined and the majority of the Institutes became increasingly reading clubs and locations for literary pursuits frequented by the middle and upper classes. This is another classic example of academic drift where provision is primarily focussed on the more academic subjects with the resultant neglect of the vocational and practical subjects.

(One fascinating element during the first part of the 18th century was the technical improvements in the development of printing that increasingly provided books and other printed material to the working classes. This most certainly began to provide opportunities for the wider population to access information and improve their reading skills and awareness of technical and scientific knowledge.)

However many positive consequences of the existence of the Institutes still exist today namely that it did highlight and identify the inherent interest of workers and employers in scientific and technical concepts and the impact of this awareness on increasing motivation and productivity. Interesting to note that other European countries and America realised these factors much sooner than England

as evidenced by the Great Exhibitions of 1851 and 1867. A number of the Institutes went on to become Working Men’s Colleges and the London Mechanics Institute later transformed into Birkbeck College for adult learners.

Working Men’s Colleges, from 1842

The Working Men’s Colleges’ mission was very different from that of the Mechanics Institutes and focussed on adult education and attempted to address deficiencies in education for working adults and provided a more general education in order to cope with social and economic issues. In many ways one could make a crude comparison of this movement with the current programmes for basic skills and financial literacy. The colleges developed very different approaches often tempered with religious influences and a number rejected the idea that education was useful in relationship to a man’s craft or profession. Various preparatory classes were offered and opportunities for progression existed to higher levels. More practical classes were introduced later (1870+) in science, bookkeeping and shorthand these last two being increasingly seen as being important in the emerging business and commerce areas. Colleges were to be found in Sheffield (People’s), London, Oxford, Wolverhampton, Halifax and Leicester. Later some of the Colleges helped to shape the University Extension movement and the college in Oxford eventually became Ruskin College with a mission to educate working men to occupy leading positions in industry and commerce. Although it must be said that these latter developments were very focussed on the arts and humanities and again aimed at the middle and upper classes.

These few examples along with others during the first half of the 18th century provide evidence of an embryonic system for technical education albeit a faltering one. However as has been said earlier it failed for a number of reasons. It must be stressed that at this time England did not even have a national primary education system so it is not surprising that a national framework for technical education had to wait until the end of the century. It was much later in the 18th century that a national system for primary pupils was established. The only semblance of a national system or network of educational institutions at this time were the Public, Grammar and Sunday schools.

Further Background on Guilds and Apprenticeships

A Guild was basically an association of craftspeople representing a particular craft or trade. The earliest known guilds were believed to have been established in India around 3800 BC. From about the 12th century European Guilds (or Gilds) and Livery Companies gradually evolved into the current equivalent of business organisations/consortia. Eventually at the end of the 1700s/early 1800s the guilds were criticised for being resistant to free trade and reluctant to adopt the newer technological and business practises and developments. They were increasingly perceived as being territorial and parochial. Industrialisation of trade and industry and the development of copyright and patent protection laws gradually eroded the power and influence of the guilds. Some commentators believe that the guilds were the precursors to the trade unions. Other commentators argue that because the guilds were associated with small business associations comprising self-employed skilled craftspeople they possessed little in common with the trade union movement. Guilds still exist today across the world e.g. in Europe they represent local craftspeople in the more traditional skills. In America guilds represent actors and writers along with other occupational groups. In the City of London, the ancient guilds survive as Livery Companies whilst in Preston a guild continues as the Preston Guild Merchant operating many of the traditional ways.

Apprentices, (originally called 'prentices'), began their careers from apprenticeship programmes. The

system of apprenticeships began in the late Middle Ages and were often managed by the craft guilds or a town government. A master craftsman was allowed to employ young people in order to provide them with formal training in a particular craft. The young person received a small amount of money whilst undergoing their training the amount increased as the programme advanced over time. Most of the apprentices were male but some programmes such as embroidery and silk-weaving involved females. The ages of apprentices ranged between 14 to 21 and on successful completion of the apprenticeship became a master craftsman. A typical apprenticeship lasted seven years. In England apprenticeships had a long tradition initially resulting from the consequences of the Poor Laws.

Another term used was that of the journeyman. A journeyman was a tradesman or craftsman who had successfully completed an apprenticeship. In Europe a journeyman would travel extensively working in different workshops and locations in order to develop greater experience and skill of their trade/craft.

The next chapter maps the next phase in the history and development of technical education including such aspects as the consequences of the Great Exhibitions of 1851 and 1867, the creation of the City and Guilds and the Finsbury Technical College and the Trade School movement.

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The Great Exhibition and beyond

The second part of the 19th century witnessed a great deal of positive progress in technical education influenced in varying degrees by earlier developments. The Mechanics Institutes and Working Men's Colleges that survived provided in a number of cases the foundations for more permanent institutions of technical instruction. Following the Great Exhibition in 1851 added impetus was given to establishing a national and effective system for technical education.

One of the most interesting if not surprising aspects of the Industrial Revolution was the fact that the pioneers had not experienced any formal education but were predominantly products of the craft apprenticeships, self-taught or were natural innovators. Brindley (canals), Telford (roads), Stephenson (engines) and other great engineers began their careers as mechanics and learnt by direct experience in the workshop and on site. Scotland produced many of the most outstanding people some of whom were educated at the Universities of Glasgow and Edinburgh which excelled in medicine, science and engineering and were far more enlightened than their English counterparts of Oxford and Cambridge. Interesting to note that the Scottish Primary School movement in the 19th century was the foremost in Europe. Although it must be said that at certain times science and the more practical subjects were taught in the ancient universities and in a number of public and grammar schools, this was an exception rather than the general rule and was not sustained over a period of time for it to achieve the required critical mass and subsequent impact.

The achievements of such brilliant engineers as Brindley, Smeaton (lighthouses and steam engine design) and Crompton (cotton and spinning technologies) did not owe much to formal education or state influence as none had seen the inside of any of the universities that existed at the time while other pioneers had attended institutions that were in main-

land Europe, or if in England, studied at dissenting institutions. The history of these dissenting academies created during the 18th /19th centuries merit a longer discussion providing as they do a fascinating insight into the dynamics between the strong influence of religion and the developing interest in science and its application. Initially these institutions trained prospective non-conformist ministers and later lay people with an approach, which was based on a positive view of science and recognising the influence and importance of the changing times. These Academies ultimately were open to all irrespective of creed provided a curriculum although biased to studies in divinity but also included such subjects as mathematics, book-keeping and French. Although a relatively short-lived movement it attracted some luminaries such as Priestley (chemist/ researcher into gases) and Dalton (chemist/ thermodynamics) and produced a number of influential former pupils who went on to make significant contributions to a wide range of disciplines including science and technology. Academies were founded in such places as Daventry, Kendal, Manchester, Northampton and Warrington.

In addition groups of like-minded engineers and scientists formed societies across the country such as the Lunar Society in Birmingham that met regularly to discuss the latest ideas and developments in science and technology and included such people as Wedgwood, Boulton, Murdock, Erasmus Darwin and Watt (See Appendix 2 for biographers). One recurring theme from these meetings was criticism of the traditional education system and its institutions which were dominated by law and theological studies and an almost total neglect of technical and scientific instruction. This oasis in the technical and science education desert is a tribute to these great individuals who contributed so much to the momentum of the Industrial Revolution.

In spite of the absence of any formal technical education the achievements of these and other indi-

country including Leeds, Newcastle, Wigan and Truro. Unfortunately many of these schools failed and by 1859 only Aberdeen, Birmingham, Bristol and Wigan survived only enrolling 395 students in all.

Developments in Higher Education

Up to now fairly negative comments have been made about the traditional universities but developments began to bring about a broader and more enlightened curriculum in the new universities that were being established. Oxford and Cambridge had dominated the sector since the early 14th century and in spite of a succession of criticisms about for example their closeness to the Establishment had done little to change. Universities or colleges that would become universities were created from the about the second decade of the 19th century including: University College, (London) in 1826; St. David's (Lampeter Wales) in 1827; King's College, (London) in 1828; Durham in 1832; University of London in 1836; Queen's College (Birmingham) in 1842; Owen's College, (Manchester) in 1851 and School of Mining, (London) also in 1852. These and other Higher Education Institutions introduced technology and science into their programmes often assisted by leading scientists, industrialists and thinkers such as: Whitworth, a machine tool manufacturer from Manchester; Brentham a philosopher from London; and Hamilton a professor of civil history from Edinburgh. These and other individuals were aware of the achievements and developments in Germany and other European countries. The developments within universities will be picked up in later chapters.

The City and Guilds of London Institute (CGLI)

Another key initiative contributing to a national system for technical education was taken by a committee of a number of Livery Companies resulting in the creation of the City and Guilds of London Institute (CGLI). As has already been said, before the establishment of the CGLI there was a growing sense of urgency to develop a national framework for technical education and to capitalise on the inherent interest of workers in science and technology but one not based primarily on State funding. At a meeting of a number of Livery Companies on 3rd July 1876 at the Mansion House the following key resolution was proposed:

viduals is truly remarkable. They greatly contributed to Britain becoming the first industrial nation and for its size, unique in history for its achievements and industrial performance. Outstanding engineering triumphs were manifest throughout the country and beyond its shores whether in shipbuilding, railways, bridges, mining etc. The existence of the empire greatly assisted access to cheap resources, the so called 'imperial bonus', but nevertheless even accepting this highly questionable advantage the magnitude of these achievements was remarkable.

The state begins to get involved

In retrospect the creation of the government's Science and Art Department has to be seen as a significant contribution to the development of the education system for this country particularly for technical education. Its formation can be seen as one consequence of the 1851 Exhibition, which highlighted the importance of science, design and art in manufacturing and the need to improve our competitiveness with other European countries and America. Initially it provided grants for arts and design helping to create the Royal College of Art and the V and A Museum. In 1840 the Department of Practical Art was created and then in 1853 a Department of Science was formed and these two were merged to create the Department of Science and Art under the control of the Board of Trade. Then in 1857 the Education Department was created which assumed the control of the Department of Science and Art. Two Departments were then established one for elementary education based at Whitehall and the other for Science and Art based at South Kensington. Therefore at last a national system began to evolve with government support but the view still persisted that it was not a direct function of the State to support technical education as the role of the Science and Art Department was to seek voluntary funding from the Livery Companies of London. This approach was opposite to that on the Continent where State funding was readily available. The approach in England was still driven by voluntarism and free enterprise i.e. a laissez faire philosophy that reinforced a characteristic that has dominated so many critical developments in our history e.g. private investment, the free market and individual endeavour. During this period from 1853 the Department began to support the creation of experimental schools and as a result Science Schools often in conjunction with Schools of Navigation were established across the

“That it is desirable that the attention of the Livery Companies be directed to the promotion of Education not only in the Metropolis but throughout the country, and especially to technical education, with the view of educating young artisans and others in the scientific and artistic branches of their trades”

A provisional committee was established in 1877 to prosecute this recommendation and this led to the founding of CGLI, which was incorporated in 1880 with the sole purpose of the Advancement of Technical Education. Philip Magnus was appointed in 1880 to be its first director and secretary. One crucial driving force behind the creation of the CGLI was that the Livery Companies felt there needed to be a general and national scheme for technical education and that they needed to work together collectively to maximise and capitalise on their individual strengths and promote the interests of several trades. The Livery Companies and their various committees continued to develop ideas on how to realise their ambitious agenda for a national system for technical education and in January 1879 considered a set of recommendations namely:

- The transference of the Society of Arts Technological Examinations to the Association of Livery Companies which had now been constituted as the CGLI for the Advancement of Technical Education
- The establishment of a Trade School at Finsbury and a Trade School of Applied Art at Kennington
- The establishment of a Central School which should serve as a training school for teachers, and which should afford technical instruction of a high character
- Grants for assisting certain technical classes already established at King's College and, elsewhere, and grants for the proposed Chairs of Chemical Technology and Mechanical Technology at University College, London

Below is some brief detail of how these four recommendations were actioned. First, technological examinations – an incredibly important initiative, which slightly predates the creation of CGLI, that required annual examinations to be held after technical instruction for the learners and teachers of hand-crafts through the UK and in the colonies. The prime mover in this development was the Royal Society of Arts. First examinations were staged in 1873 when 6 candidates presented themselves. This number

gradually increased to 184 in 1878 following financial assistance from the Clothworkers Company to pay teachers for registering the candidates. Following the establishment of CGLI and the subsequent transfer of responsibility for the technical examinations to the Institute - more rapid progress was witnessed. The table below shows the situation between 1879 and 1900 which reflects the beginning of a national examination system for technical subjects. (Readers may have their own interpretations for the poor pass rate!)

Year	Number of subjects	Number of centres	Number of candidates	Number of passes
1879	7	28	202	151
1880	24	89	816	515
1890	49	219	6,667	3,507
1900	64	390	14,551	8,114

Finsbury Technical College was the first true Technical College in England when day and evening classes were held from November 1879 with the official opening in 1883. Subjects taught initially included applied chemistry and physics and mechanical engineering. Students, both sexes, were enrolled from those who wished to study scientific and practical instruction for intermediate posts in industry or from schools preparing for entry to the Central Institution in higher technical and scientific studies. Evening classes were provided for people working during the day in order for them to receive additional instruction in art, practice and science to more fully understand industrial processes. One very important distinction between the College and the Mechanics Institutes was that at the College practical work formed part of the programme whereas the Mechanics Institutes predominately taught the theoretical aspects of technology and science. It was organised and managed by way of a number of departments that catered for the different subjects and differing attendance modes. Throughout its relatively short history even with the continuing support of the Livery Companies and the CGLI the College experienced continuing funding problems. The College in many ways set the model for technical education and its constituent institutions from then on.

The City and Guilds has and continues to be one of the few jewels in the crown of technical and vocational education. As well as being the premier

awarding body for trade, craft, vocational and technical qualifications it has played a significant role in other developments such as establishing the Finsbury Technical College and Imperial College. Throughout its history it has maintained close working relationships with the Livery Companies and employers. The Institute has remained true to its founding principles and has not succumbed to academic drift.

Other awarding bodies existed but were associated with predominantly non-scientific and non-technological subjects and included the Royal Society of

Arts, College of Preceptors and a number of Regional Union Institutions. An excellent history of examinations including in technical education can be found in R.J. Montgomery's 'Examinations' (Longman, 1965). This is a fascinating and complex topic in its own right.

As one can see the momentum, at last, was now being generated and the basic framework for a national system for technical education was emerging in colleges, industry and other training providers and

Some relevant Parliamentary Reports, Committees and Commissions during the 18th century

- Report of the Commissioners to inquire into the State of Popular Education in England. (The Newcastle Report). 1861
- Report of HM Commissioners to inquire into the Resources and Management of certain Colleges and Schools (The Clarendon Report). 1864
- Report of the Royal Commission. (The Taunton Report). 1868
- Report of the Royal Commission on Scientific Instruction and the Advance of Science. (The Devonshire Report). 1872-5
- Report of the Departmental Committee on Intermediate and Higher Education in Wales (The Aberdare Report). 1881
- Report of the Royal Commission on Technical Instruction. (The Samuelson Report). 1882-4

Interesting to note many of these reports advocated the introduction of mathematics science and practical subjects into the school curriculum although all too often these recommendations failed to materialise.

(To add value to this short history of technical education I have provided a set of biographies of organisations and individuals that have contributed to the subject in Appendix 2)

References

- Kelly. T. (1970) 'History of Adult Education' Liverpool University Press
 Lang. J. (1978). 'CGLI – Centenary 1878 – 1978' CGLI
 Montgomery. R.J. (1965) 'Examinations' Longmans

(A more comprehensive book list is provided in Appendix 4)

The 1880s

This chapter will almost complete the history in the 19th century. Again I am conscious that a number of important developments have inevitably been sacrificed as a result of space limitations and I apologise for these omissions. Chapter 2 concluded with the implementation of the four main recommendations by the Livery Companies and the beginning of this part describes the completion of the implementation.

City and Guilds Technical Art School at Kennington

Established in 1878 in Kennington being an extension and further development of the South London Art School, which had already established a high reputation. The new institution was an example of a trade school for applied art enrolling students engaged in art and the industries in the locality including such subjects as: illustration, pottery, sculpture, and house decoration. This institute by focussing on the applied aspects of art very much mirrored the vocational mission of the Finsbury Technical College and went on to produce many notable people in the world of applied art.

Central Institution at South Kensington

This institution focussed on the instruction and the awarding of qualifications in the practical aspects of scientific and artistic subjects necessary for entry to such professions as: technical teachers, architects, mechanical, civil and electrical engineers and senior people in the chemical and other manufacturing industries. Formally opened in June 1884 by the Prince of Wales, then President of the CGLI, it adopted a very different approach in its instruction from the existing universities focussing on the practical applications of science to industrial methods. It very much mirrored the approach adopted by the Finsbury Technical College and the CGLI Institution of Technical

Art focussing on applied science and art as opposed to the theoretical and pure aspects of these subjects. In addition the Institution offered opportunities for progression to HE to students completing their studies at Finsbury Technical College and the Technical Art School. These two institutions today could be equated with Colleges of Further Education (CFEs). Philip Magnus with his extensive knowledge of developments in mainland Europe and direct involvement with CGLI was a key figure in configuring the Central Institution and technical education owes a great deal to this visionary individual. Subsequently the Goldsmiths' Company provided very generous funding to extend the buildings and facilities of the College which eventually became the Central Technical College and finally in 1909 the Engineering Section of the Imperial College of Science and Technology under the title of the CGLI (Engineering) College.

Grants to technical institutions in London and beyond

The Livery Companies and the CGLI continued to provide grants to existing technical institutions both within London and a number of provincial towns throughout England. Grants, subsidies and scholarships from these two organisations included:

- The London Polytechnic and the Artisans' Institutes (more about these institutions later)
- Subsidy to the British Horological Society
- Annual grant to the Society for Promoting Employment of Women
- The Leicester, Manchester and Sheffield Schools
- Engineering Departments at University College, Nottingham, Mechanical and Chemical Engineering Departments and for the study of Metallurgy at King's College, London and the School of Practical Fine Art in London
- Extensive grants for textiles to a number of colleges including Bradford, Stroud, Trowbridge and Halifax.

This list is by no means exhaustive but indicates that from around 1881 additional external funding began to establish a wide range of technical institutions that reflected and aided the industrial bases at the end of the 19th and beginning of the 20th centuries. Various writers have estimated the total amount of money given by the Livery Companies and the CGLI was of the order of £2,000,000 over a period of forty years which was an immense sum at that time. However it ultimately proved impossible to sustain this level of financial support and it was becoming clear that State funding was essential in order to create a more secure and long-term basis for the consolidation and further expansion of technical education and its constituent institutions.

Artisans' Institute and the Polytechnics

These two important and influential movements merit mentioning. The Artisans' Institute although it predated the formation of the Finsbury Technical College was a significant establishment. The Institute was founded in 1874 following a number of meetings and conferences held during 1873 some of which were held at RSA. They were supported by a number of key figures representing various trades, which led to the creation of the Trades Guild of Learning, which in turn established the Artisans' Institute. The following resolution of a meeting held in March 1873 indicates the intentions of the Trades Guild of Learning:

"That in the opinion of this meeting it is desirable to form a Trades Guild of Learning with the view of promoting the delivery of lectures, and the formation of classes, to assist members of trade societies and other skilled workmen in acquiring a knowledge of history, political economy, and technical education, as well as of literature, science and art generally."

The Trades Guild of Learning quickly led to the development of the Artisans' Institute and true to its founding principles focussed on a wide range of trades. Interesting to note the creation of the Guild and the Institute was triggered by a growing disillusionment with the weakness of technical education and the demise at the time of many apprenticeship programmes. The purpose of the Institution was to:

"Offer systematic instruction of workmen and apprentices in the principles of art and science forming the basis of various handicrafts and in the technical applications of those principles to actual work. In other words the object may be stated as that of afford-

ing combined instruction in principles and practice, the one illustrating the other."

This set of objectives is as relevant today as it was then. Another interesting aspect of the Institution was that its instruction would complement the training in the workshop or factory and not attempt to subvert it. The Institution was housed in relatively small premises in St. Martin's Lane and the range of trades and other subjects was remarkable for the time including: Plumbing, Carpentry, Pattern Making, Sheet Metal Working and Bricklaying. In addition classes were offered in science and mathematics with such subjects as Geometry, Applied Mechanics, Building Construction as well as in the Arts. To further enhance the curriculum lectures were given in Industrial History, Economics and Politics although sadly these subjects failed to recruit many students. A series of problems with funding, premises and weak management eventually brought about the incorporation in 1883 of the Artisans' Institute into the newly created Finsbury Technical College as the Trades Class Department. Throughout its relatively short life the Artisans' Institute received considerable support from the Livery Companies and CGLI as well as having a strong advocate in Philip Magnus then Director and Secretary of the CGLI. Notable teachers were employed included Professors Armitage and Ayrton who were to become pioneers in the teaching of science education. Equally important were a number of successful former students who went on to become influential figures in industry and technical education.

The creation of the Polytechnic in Regent Street in 1882 was a quantum leap in terms of size and financial backing. To date the technical institutions depended on the generosity of the Livery Companies, the CGLI, the Science and Arts Department and a few benefactors. However in order to begin to compete with America and Europe larger institutions with better facilities had to be built and the critical need for the State to become more directly involved to fully realise this aspiration. The driving force behind the Polytechnic was Quintin Hogg who had already invested heavily in his Long Acre Institute, which he founded in 1878. Quintin Hogg spent over £100,000 in creating the Polytechnic and his commitment and belief in technical education was truly remarkable. He was the catalyst in the formation of other Polytechnics in London in conjunction with the financial support and patronage of the City Parochial Founda-

tion and the Charity Commissioners. In 1883 the City of London Parochial Act further added impetus to the development of technical education in London. The Act amongst other aspects made a commitment to create, fund and promote:

- Education for the poorer inhabitants of London in technical, secondary and art subjects
- Public libraries, art galleries and museums
- Extend working men's and women's institutions

Central funds were established to realise these worthy endeavours and included capital grants to Polytechnics and the Charity Commissioners influenced by the Report of the Royal Commission on Technical Education and evidence from CGLI. Other Polytechnics were established across London. Interesting to note that even at this time differing views existed about the relevance of technical education particularly for the poorer members of society and at HE level and a number of individuals openly questioned the need let alone the importance of such proposals. In spite of this opposition the recommendations of the Charity Commissioners were accepted and the endowments to the institutions were implemented. These developments were inevitably focussed on London but nevertheless provided valuable experience for later developments across England and beyond. This example of London centricity raises some interesting questions. Other developments were happening elsewhere in England but overall these have not been fully documented – perhaps that is a worthy project for the future?

People's Palace

Mention should also be made of the People's Palace situated in the East End of London, which started life as a place of amusement. Later with financial support from the Drapers' Company and other trust organisations it offered courses in trades and industrial disciplines to young workers. Eventually it closed but the East London College was incorporated into the Finsbury Technical College and is now Queen Mary College, part of the University of London.

One striking impression during this time is the rapid growth of different kinds of technical institutions many of which were short-lived whilst others thrived and ultimately transmogrified into major institutions. The period 1850-90 witnessed in London and beyond a rapid development of technical education with widely differing purposes, operating at

different levels and managed in a variety of ways. As has been seen new institutions were created whilst existing ones like some of the Mechanics Institutes were assimilated into others. The hands off approach adopted by successive governments of the time had produced an array of largely unregulated technical institutions - the inevitable consequence of the laissez faire philosophy (interesting to compare the situation today where the free market is still encouraged!). The concern about the unregulated growth of technical education and its constituent institutions was one of the factors that led to the establishment in 1881 of the Royal Commission on Technical Education (The Samuelson Report).

The Royal Commission 1881

The Samuelson Commission was set up in 1881 with the following terms of reference:

"To inquire into the instruction of the industrial classes of certain foreign countries in technical and other subjects for the purpose of comparison with that of the corresponding classes in his country; and into the influence of such instruction on manufacturing and other industries at home and abroad"

Coupled with the concerns about the unregulated nature of technical education institutions was the continuing and increasing worry about the declining ability to compete with overseas countries as evidenced in the Exhibitions of 1851 and 1867.

The most important outcomes from the published reports by the Commission were the comparisons with other countries, which showed this country's continuing lack of effective instruction in science in schools particularly its relationship with industrial practice and the absence of a national system for technical education. The reports were published in 1882 and 1884 and ultimately lead to the Technical Instruction Act of 1889, which was the first piece of legislation of any real significance in technical education. The Samuelson Commission made a number of key recommendations three of which related directly to technical and secondary education namely:

- "That steps be taken to accelerate the application of ancient endowments, under amended schemes to secondary and technical education,
- That provision to be made by the Charity Commissioners for the establishment, in suitable localities, of schools or departments of schools, in which the study of natural science, drawing,

mathematics and modern languages shall take the place of Latin and Greek,

- That local authorities be empowered, if they think fit to establish, maintain and contribute to the establishment and maintenance of secondary and technical (including agricultural) schools and colleges.”

These were significant recommendations and strongly influenced the 1888 Local Government Act and the 1889 Technical Instruction Act. The Commission made other relevant recommendations including more support for CGLI and more teaching of science and art in training colleges, which were now being created. In addition the Commission suggested that young people should have the opportunity to receive technical instruction either in works schools or in other schools and that the employers and trade organisations would make financial contributions to this initiative.

The Technical Instruction Act 1889

The Technical Instruction Act was passed thirty-eight years after the Great Exhibition and twenty-two years after the Paris Exhibition. The Act fully recognised the need for a national framework for technical education in an attempt to halt industrial and manufacturing decline. It gave powers to the County Councils and the Urban Sanitary Authorities to levy a penny tax to support technical and manual instruction. The curricula in technical institutions also had to be approved by the Science and Art Department. In the following year the Local Taxation Act introduced the ‘whiskey tax,’ which made extra money

available for technical instruction. The ‘whiskey tax’ proved to be a windfall. Originally a fund for compensating the former licensees of redundant public houses, it was deflected to the county councils for the promotion of technical education. The majority of authorities established Technical Instruction Committees and this brought about a rapid development of technical institutions across the country in order to satisfy local needs. Between 1892/93 and 1901/02 the amount raised via the whiskey tax rose from £472,500 to £859,011 – this last figure represented 83% of the total public expenditure on technical education! The Balfour Act of 1902 eventually repealed the Act empowering the expenditure of the whiskey tax by authorities for technical education although the money was still ring - fenced in this Act for the development of HE. The issue of the whiskey tax is a fascinating episode in the history of education. Could it have been an early example of a hypothecated tax? Interesting to note the development critically depended on the consumption of alcohol but it did accelerate the development of technical education at the end of the 19th century and the North of England, as usual did just that!

The next chapter will conclude the developments at the end of the nineteenth century, that were at last moving with great rapidity and will continue by mapping the progress into the early 20th century.

References

(See the extensive book list in Appendix 4 on page 98)

The end of the 19th century

The pace of development in technical education slowed dramatically between 1905 and 1945 with a more gradual evolution based on the foundations that were laid in those twenty or so years in the 19th century. In fact evening student numbers in technical subjects had reached a peak in the early 1900s and except for a few fluctuations remained relatively constant until the 1940s. From the 40s the driving forces were the increased demand for scientists and technologists in industry coupled with the acute shortage of skilled, highly qualified researchers, technicians and operatives. Also there was a continuing shortage of teachers of science and technologists. These factors coupled with increased demand from business and commerce gave rise to a number of reviews, which in turn brought about an expansion after the 1940s.

Evening Continuation Schools

Evening schools had existed for many years and were operated under the Elementary Schools Code but offered a rather limited curriculum all too often repeating the work covered in the elementary day schools. In addition to the narrow range of subjects strict age limits were imposed in order to gain funding from the Science and Art Department. However in 1898 a separate code for Evening Continuation Schools was issued which dramatically changed the situation. A wider range of subjects was introduced along with the removal of the age restrictions allowing persons over the ordinary school leaving age to attend classes. In addition to these changes new more effective funding arrangements based on attendance and not on examination results was introduced. The students who enrolled for evenings fell into two categories one group wishing to progress onto a technical school and the other that would complete their studies and leave formal education. The consequences of these reforms were immediate - enrolments doubled

in three years. This greatly assisted the development of technical education as more people were able to progress onto more specialised programmes. Grouped programmes were organised in five main themes to reflect the occupations or industries that the students wished to enter. These five groups were industrial, commercial, domestic, rural and general. Initially the industrial and commercial groupings enrolled the most students but later the general programme became more popular. In some areas of the country the School worked in collaboration with the university colleges in their locality. It is important to realise that up to this time many of these subjects were not eligible for funding in elementary schools - grants were only available for a limited range of science subjects. Even though the majority of the teaching was at a very basic level it did increase participation and ultimately created a greater demand at the higher levels. In 1901 the responsibility for these Schools was transferred to the Science and Art Department and the Board of Education, which already funded other evening classes in science and art and organised science schools.

Board of Education

The Board of Education Act of 1899 brought together the powers previously held by the Education Department and the Science and Art Department. Then in 1901, as mentioned above, the responsibility for the central administration of the evening continuation schools was transferred to the South Kensington Branch of the Board. These various reforms culminated in the 1902 Education Act that formally created Local Education Authorities (LEAs) who would play a significant part in the development of Further Education (FE) in the 20th century.

The Education Act 1902

The Act replaced the School Boards with the LEAs and these were given wide-ranging powers to administer all higher education up to university level but not including programmes of study within the university sector. (This exclusion continued during the 20th century; the HE work outside the university sector being designated as non-prescribed provision. The Act represented the first comprehensive Bill to reach the Statute Book. The major challenge for the LEAs arising from the Act was to bring order across the amorphous and somewhat disjointed systems of the education sectors and their constituent institutions. LEAs were empowered to co-ordinate elementary and higher education, (excluding universities), and at the time defined the possibility of providing “the ladder from elementary school to university.” To assist the realisation of this lofty aspiration, scholarships were available to able pupils from the elementary schools. Balfour in this speech to the House of Commons stressed that a successful technical education and higher education system depended critically on a sound elementary and secondary education system. The Act clarified the limitations imposed by the 1899 Act of the Board of Education and attempted to put in place a set of duties and responsibilities for the LEAs. Part of the Act stated: “the LEAs shall consider the needs of their area and take steps as seem to them desirable, to supply or aid the supply of education other than elementary, and to promote the general coordination of all forms of education.” It is important to note the use of the words ‘consider’ and ‘take steps as seem to them desirable’ as these gave rise to LEAs exercising different degrees of discretion and differing interpretations when implementing the Act and this most certainly was true for technical education institutions. Many LEAs established and supported technical education to a large extent whilst others showed less enthusiasm. In many cases the munificence of provision in technical institutions can be likened to the Victorian propensity to build chapels and churches with certain similar results in the longer term. The use of such discretionary expressions in subsequent Parliamentary legislation has also produced similar results creating a range of technical institutions in terms of quality and quantity. The exercise of discretion coupled with lack of sufficient resources has dogged technical education throughout its history and sadly reflects the market mentality that persists even today. The 1902 Act was

particularly successful in the provision of county secondary education and teacher training colleges but partly because of inadequate resources and the discretionary elements in the Act it was not so successful in bringing about a unified education system. A number of writers, for example P.W. Musgrave in ‘Society and Education in England since 1800’ (Methuen, 1969), have commented that the 1902 Act had a detrimental effect on technical education because the funding was focussed on secondary schools and teacher training.

In 1904 a set of three new regulations and codes was produced which dealt with evening and continuation schools, technical institutions for advanced, specialised, full-time instruction and with a variety of day technical classes. The framework for the future structure of technical, (further), education had finally begun albeit slowly particularly in comparison with our international competitors.

Other relevant developments

It’s an opportune time to briefly describe a range of other developments that have influenced technical education. Even though the State kept its distance from direct involvement in technical education for most of the 19th century there was one striking and obvious exception, namely the military. The armed services personnel received technical training and a great deal of government funding and attention was focussed on the manufacture of weapons to sustain, support and drive the Empire. Military schools and academies were established including: the Royal Military Academy at Woolwich in 1741, the Royal Military College at Sandhurst in 1799, the Royal Naval College at Greenwich in 1873. Army Certificates of Education were first awarded in 1800 and service personnel were required to learn arithmetic for the use of ballistics and other related scientific and technological prin-

Year	Military Expenditure		Education Expenditure		Total	
	£m	%	£m	%	£m	%
1840-49	15.1	30	0.3	1	51.0	100
1850-59	21.9	37	0.7	1	59.6	100
1860-69	26.8	41	1.3	2	64.6	100
1870-79	24.2	37	2.6	4	66.1	100
1880-89	28.0	37	4.9	6	76.7	100
1890-99	36.4	41	9.2	10	89.2	100
1900-09	79.1	55	14.9	10	143.6	100

Source: B.R. Mitchell and P. Deane, *Abstract of British Historical Statistics*, (CUP 1962)

ciples of their equipment. The following table shows clearly the relatively low expenditure and slow development of education between 1840/49 and 1900/09 when compared with military expenditure:

The two world wars accelerated the commitment of the armed forces to technical innovation and development and this will be described in chapters.

One very real challenge writing this history is the difficulty in assessing how much industry itself provided in-house training for its workers. Analysis of statistical data and company reports provide little direct evidence within the budgets that any training was offered. Most industries relied on unskilled labour and the gradual flow of people from apprenticeship programmes or provision from technical schools and colleges. Very few graduates were employed in industry during the later part of the 19th century in spite of the development of the new technologies associated with the chemical and iron ship building industries. So far this history has mainly focussed on how the slow and almost random development of a comprehensive national system for technical education particularly in relation to our competitors has contributed to this country's industrial decline. But as part 1 indicated other key factors were in play and many writers have highlighted these as being associated with the way industry was managed and organised during the 18th and 19th centuries. Even though many of the industries employed thousands of workers each was invariably privately owned by one family and depended critically on a number of individuals, creating what is now referred to as individualist capitalism. This led to a series of features that ultimately contributed to industrial decline with cutthroat competition and a culture of independence that did not encourage the development of a clear identity across each of the various industrial sectors. Our competitors more quickly created national structures to oversee their emerging industries coupled with State funding for technical education. The advantage of being the first industrial nation finally led to a series of obstacles in the form of organisational structures and work practices that became ossified and resistant to change as the new technologies and processes were later discovered. The *laissez faire* approach permeated the way this country's industrial companies were organised and managed and they continued to operate a form of capitalism that was trapped in the old order – individualist and competitive with each other. This often resulted in the companies remaining small that

ultimately disadvantaged them from competing with the larger organisations both within Britain or overseas. A number of writers have also argued that after the initial surge of innovation the entrepreneurial spirit waned and only barely competent managers took over. Another important factor was the continuing hostility to technology and this fuelled the culture of indifference towards technological advance and the associated negative perception of technical education, a factor that still persists today as evidenced by skills shortages and declining enrolments in mathematics, engineering and science disciplines.

One interesting consequence of the way industry evolved and was organised during the industrial revolution here was the role of the trade unions. Initially quite rightly the unions and other worker groups fought for the improvements of working conditions and wages and were not directly involved with training. Union membership was relatively low, mainly due to the attitudes of the employers. However membership began to grow significantly in the early part of the 20th century because of concerns about the level of pay, conditions of work and the state of the economy. During the 20th century trade unions became more directly involved with training and this will be picked up in later chapters.

Mention has already been made of the development of the new universities which were created during the last half of the 19th century and their commitment to technical and scientific subjects. These developments continued into the early 20th century and the number of graduates in these subjects increased significantly albeit from a very low base. Running parallel to these developments was the growing belief in “professionalisation” and this was particularly manifest in the engineering and science professions although it was also apparent in other fields but not to such a degree. Census data indicates the rapid growth of numbers in the new professions and a number of key institutions representing these disciplines were established during the 19th century e.g. Civil Engineering (surprisingly founded in 1818), Mechanical Engineering (107 members in 1847), Mining (founded in 1889). These and other key organisations increasingly set the standards for their respective disciplines and contributed to raising the profile of technological subjects although it must be said usually only at the higher levels of the profession.

The Royal Society of Arts continued to be a major force in education particularly with the development

of examinations and briefly at the beginning involved with technical subjects until the CGLI took over that responsibility. The Royal Institution was founded in 1800 to communicate and facilitate the general introduction of scientific and technical invention to a wider audience and later greatly influenced science teaching. The British Association for the Advancement of Science founded in 1831 encouraged the teaching of science in schools. These and other scientific and technologically related professional bodies often developed their own specialist examinations and standards frameworks in order to recognise their areas of work.

Science Education

The history of the development of science education in England is as fascinating as that of technical education and in many ways mirrors the same sorts of issues. Bernal in his book 'Science and Industry in the 19th Century' provides detailed analysis of the relationship between science, industry and the technologies. The battle for scientific education and its place in the general educational system in England was intense throughout the 19th century. Schools and universities were still preoccupied with traditional subjects of religion and renaissance humanism. In addition advances in biology and geology began to question the truth of the bible and resistance to such disciplines were very apparent from many quarters. Scientific discoveries had little impact on industrial processes until the latter end of the 19th century. Where science was taught in the older universities it was very formal and theoretical. No practical science

teaching was given in England, even in Cambridge, before 1845, and then it developed very slowly. The new London colleges and the older Scottish universities/colleges provided more science but again it was biased towards the theoretical aspects. The College of Chemistry, (later to become the Royal College of Science), was an exception. Interesting to note its first director was appointed from Germany namely A. W. von Hoffman. Scientific research was even more limited than scientific training in England. The only research institution was the Royal Institution founded by Count Rumford in 1797. Most research scientists carried out their work usually funded by themselves often in inadequate accommodation such as in cellars. It was only after 1860 that large research laboratories developed initially in Germany and then spread very slowly across Europe and the rest of the world. Another rare example of scientific endeavour was the British Association for the Advancement of Science met first in York in 1831. The leading light was Charles Babbage who was very critical of the work of the Royal Society and its failure to realise its 17th century aims. The Association became the main force of scientific advance throughout the 19th century and ultimately greatly assisted in raising the profile of science and scientific education in England.

The next chapter will continue to describe the development of technical education during the first few decades of the 20th century and the impact of the two world wars. Also the influence of the social, financial and political factors of that time will be explored in relation to the development of technical education.

Some relevant Parliamentary Acts, Committees and Commissions in the early 20th century

- Education Act (The Balfour Act) 1902
- Regulations and Codes following the 1902 Act (1904)

(See the extensive chronology provided in Appendix 1)

References

- Bernal. J. D. (1953) 'Science and Industry in the 19th Century' RKP
 Musgrave. P. W. (1968) 'Society and Education in England since 1800' Methuen

The early 20th century

As this short and at times personal history of technical education moves into the 20th century it is appropriate to pause to consider and explore a number of factors that have influenced its development up to this time. Such an analysis will be helpful in describing its subsequent development during the 20th century.

The period from 1870 witnessed the decline of this country's predominance in manufacturing, innovation and more worryingly by the failure to develop and exploit new scientific discoveries and their application to industrial processes. The measures of decline can be described both in absolute and relative terms when compared with our competitors. The country was not only losing its international market share in the traditional industries e.g. steel, ship building and textiles but more concerning was its failure to capitalise on the newer technologies in such areas as chemical and electrical engineering. The following few examples attempt to illustrate these two aspects of decline during the late 19th and early 20th century. For example in 1880 the UK accounted for 41.1% of the world's manufactured products but by 1913 this had decreased to 29.9%. In 1913 the British chemical industry represented just 11% of the world market compared with 34% and 24% held respectively by America and Germany. The final example shows the country's failure to embrace and exploit the modern technologies even though we had been in the forefront of many of these discoveries. In electrical technology we quickly lost our initial advantage to other countries e.g. by 1913 the UK's electrical industry was just a third the size of that of Germany. It was the failure to compete in the traditional industries as well as those associated with the new industrial processes which makes the picture so depressing. In addition our industry was becoming known for poor quality products and this coupled with decreasing levels of productivity compared with our competitors further contributed to our decline after being the first

major industrial nation. Sadly it is very reminiscent of the situation up to the currently time.

These statistics and other forms of evidence emphasised and reinforced this country's continued failure to recognise the importance of a national system for technical education and its inability to rise to the challenges and opportunities that technological innovation afforded. In addition to numerous statistical reports a number of influential individuals had conducted a series of comparative studies with our major competitors, for example A. Shadwell in 'Industrial Efficiency, A Comparative Study of Industrial Life in England, Germany and America' (Longman, Green 1906) and P. Magnus in 'Industrial Education' (RKP 1888). Shadwell had carried out a very detailed analysis of the relative industrial efficiencies of Germany, America and England. His findings reinforced earlier reports that English industry was over regulated by government and was reluctant to invest in up-to-date equipment. A typical quote by Shadwell reflected his view of this country's performance "*Other nations have not only caught up with us from behind but have surpassed us*" and he continues that Germany and America regarded England with "*a mixture of contempt and pity as a spent force.*" Shadwell also pointed out the superiority of the German education system namely that it worked closely with industry and fully recognised the importance of the application of science in industry. Both Shadwell and Magnus commented very favourably on Germany's commitment to training and the national system for commercial and technical education when compared with this country.

Coupled to this was the continuing indifference of successive governments, mainly fuelled by ignorance of technical and scientific concepts, to recognise the strategic importance of science and more importantly its application to the future economic health of the country. It is depressing looking back to this period when so much was happening as a result of scien-

tific discovery and technological innovation that the political community failed to fully realise their importance and as a result had little or no impact on government policy not only for industry but also for technical education.

Earlier chapters highlighted that the growth and development of technical education was to say the least unsystematic, if not haphazard, and this as a result had created a complex, confused and disjointed system, which was only too apparent at the time of the 1902 Education Act. Unfortunately this confusing complexity has continued right up the present time and has contributed to the relatively poor public perception and track record of technical education. Successive governments have failed to tackle and implement educational reforms that could have created a national system of technical education that could be equally valued with the so-called academic route. The long gestation period to establish and locate technical education within a national framework has most certainly contributed to this country's decline and weakened our competitive edge over the past 150 years. The striking feature of the English education system particularly for secondary and technical sectors that emerges was the lack of any central direction and the absence of the essential elements necessary for any overall organisation namely coherence and integration. As touched on earlier one essential and critical factor that had impeded the development of a national framework for technical education was the inadequacy of existing elementary and secondary schools and the absence of practical subjects and science which would have provided a flow of more educated young people into the technical institutions that existed at the time. Obviously the ultimate success, well-being and long term security of technical education critically depended on a sufficient flow of suitably qualified young people from schools. In spite of many worthy attempts by a number of visionary individuals in creating institutions for technical instruction e.g. Mechanics Institutes, Polytechnics etc the majority failed mostly because of weaknesses in the learners' educational background. Inadequate basic literacy and numeracy skills coupled with lack of any scientific and technical awareness, either theoretical or practical, possessed by the learners was a result of inadequate and in some cases non-existent schooling. Margaret Gowing made the following, and in my eyes correct, judgement in her Wilkins Lecture to the Royal Society of London in July 1977:

"Most economic historians seek objective, primarily economic explanations ranging from markets and tariff policy to the complexity of Britain's inherited industrial structure. In this interpretation, education is scarcely mentioned, and such views attune with our current disenchantment at the results of recent large educational expenditure. Of course it is impossible to draw a simple cause and effect line between education and economic strength – but a smaller group of historians do accept that Britain's failure in the nineteenth century to develop the educational system essential for national efficiency was a main cause of this decline. I am on their side"

As already mentioned the period between the late 19th and early 20th centuries was one of unparalleled change in science and technology and this inevitably impacted and subsequently influenced social and economic thinking. Many historians have attempted to describe the industrial decline but as Gowing commented very few linked the decline with the weakness in education particularly the elements relating to industry. However one aspect where historians did agree was that at the beginning of the 20th century the traditional English view still persisted namely that theory and practice should be separated and schools should concentrate on the theoretical aspects whilst the practical activities were delivered in the workshop. This was reinforced by the 1889 Technical Instruction Act that had expressly stated that schools should not be involved in the instruction of any trade or industry. This approach was in stark contrast to similar schools elsewhere in Europe, which emphasised the importance of workshop practice and the apprenticeship. This country has always seen industrial training as the responsibility of industry itself again in contrast with our competitors. Even with the 1902 Education Act that belatedly established a national system for state secondary education, the curriculum it perpetuated was based on the traditional public school academic model. The Act introduced a co-ordinated national system of education but was very much a compromise. This was evidenced by the fact that the older grammar schools and the public schools remained apart and continued to pursue a classical education preparing students for entry to Oxbridge and the professions. It took the Great War to begin to bring about changes in perception of technical subjects. For example it was only after the First World War that craft subjects such as

plumbing, carpentry, joinery, welding and fabrication were introduced in a number of technical schools.

Developments in the universities

One crucial indicator of a country’s commitment to technical education is the number of graduates in such subjects as the sciences, engineering and technologies. As has been said before England was significantly lagging behind other countries including Germany, America and France in this area. Industry during the 19th century employed very few graduates both at management and specialist level again in stark contrast to our main competitors. This to some extent reflected the attitude of industry that did not create a demand for scientists and engineering but more importantly successive governments had failed to establish a unified educational system. Rather belatedly the newer universities and university colleges (many of which were referred to later as civic universities) were established to train the cadres of scientists and engineers/technologists. In addition successive governments had not invested or encouraged the ancient universities to develop provision in line with the emerging technologies and newer industrial processes such as electrical and chemical engineering. The development of the university sector at this critical period especially in the technical subjects again reflects the low esteem that the country held the application of science and its impact on industry. Even at the higher levels of achievement we lagged well behind other countries and coupled with the inadequate provision at university level sadly reflected how industry was responding to the new technologies.

It will be helpful to quickly review the development of the universities in England as this reflects the commitment. In 1902 six universities existed in England namely Oxford, Cambridge, Durham, London, Birmingham and the federal Victoria University. This compares with twenty universities in Germany at the beginning of the 19th century many of which had a strong commitment to technical subjects. However during the early part of the 20th century there was a relatively rapid development of new independent universities. Victoria ceased to be a federation and separate institutions of Manchester and Liverpool were established in 1903, and Leeds in 1904 quickly followed by Sheffield in 1905 and Bristol in 1909. These universities and their precursors as university colleges had been encouraged by the gov-

ernment but not supported or funded adequately to develop honours and general degree programmes in technical subjects. Enrolments in these subjects increased although were relatively low when compared with our competitors. For example in 1910 the total number of graduates in science and technology from all institutions offering these programmes was just 3,000 compared with 25,000 in Germany. The following summary attempts to indicate the relatively slow growth of science and technology graduates from 1870 to 1910. Figures do not include graduate numbers from Oxford or Cambridge, which were dominated by mathematics.

Subject	1870	1880	1890	1900	1910
Sciences	13	38	136	304	800
Technologies	6	17	30	74	431
Totals	19	55	166	378	1 231

The overall domination of Oxbridge in the university sector continued well into the 20th century for example even in 1938 these two institutions still accounted for 20% of the total university population. Interesting to note that in 1938 the total university student population was around 50,000. Another interesting but depressing statistic was that in 1908 the number of full-time students in provincial university colleges and technical schools was below 3,000.

As mentioned in Chapter 4 the political machinations associated with the 1902 Education Act had produced a set of compromises that amongst other elements had weakened the existing central system and replaced it with power bases devolved to county and county borough level. This left the further development of technical education to the discretion of local authorities which up to then had shown little interest in this aspect of education. This cocktail of localism and discretion laced with the inevitable ambiguities enshrined in the 1902 Act most certainly impeded the development of a national system for technical education. The 1902 Education Act is yet another classic example of the laissez- faire philosophy so beloved by successive governments. This hands off, piecemeal philosophy which by definition is permissive has continued up to the present time as evidenced by the operation of the so-called free market in recent times and will be described in later parts.

The whiskey tax had provided some additional monies for technical education but not all had been used exclusively, only 59% of the total raised was used for that purpose because some authorities had spent it on strengthening secondary education. Even more concerning was the fact that much of the money had been spent on encouraging and improving the teaching of pure science rather than for technical subjects. This sad fact again reinforces the impression of a hostile perception of technical subjects and that this country regarded pure science as more important and of higher status than its application.

In spite of 500 new secondary schools opening as a result of the 1904 Education Act the post-14 participation rate was under 20% that meant that the reforms had little impact in encouraging pupils

to stay on at school, let alone progress onto further study in technical subjects.

The gradual realisation of some of the weaknesses within the 1902 Act were picked up and addressed by the Lewis Report (1917) and the 1918 Education Act and these will be considered in the next few chapters along with the development of examinations for technical subjects. Clearly the Great War would have a number of repercussions on the future development and shape of the national education system.

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Between the wars: 1918 to 1939

Compared with developments during the late 19th century very little occurred in the development of technical and further education over the few decades following the 1902 Education Act. The devolution of power to local authorities most certainly slowed down the impetus that had been generated during the latter half of the 19th century. As mentioned earlier the provisions in the Act were of a permissive nature and not a duty, which had been placed on the local authorities and their education committees. Interesting to note that following the 1902 Act politicians became concerned about the loss of central control on education and one of the initial intentions of the next major Act, in 1918, was an attempt to wrest back some of those powers given to the local authorities. However yet again worthy intentions by a number of informed and knowledgeable individuals were thwarted and as so often with such political developments another classic fudge was achieved.

When reading the history of education it is a miracle that a national system of education across any of the sectors was ever realised bearing in mind the succession of compromises and political machinations. Even with the development of secondary education in the early 20th century there was still great uncertainty about technical and scientific subjects and their place in the school curriculum. In the early 1930s there were still only about 100 junior technical schools enrolling approximately 30,000 students in 1937. Before the Second World War day release schemes for apprentices from industry were at a very low level. Regional development of technical education was equally slow although the first really concerted effort to establish any semblance of regional co-ordination occurred in 1928 when the Board of Education created the Yorkshire Council for Further Education.

Full and part time education

The two most important clauses in the 1918 Act that would eventually influence technical education were the raising of the school leaving age and the possibility of creating a system of part-time continuation education for young people not in full-time education ultimately up to the age of eighteen. Both these important clauses, if implemented, would have acted as a catalyst, which would have brought about a greater degree of integration and coherence between the academic and technical streams of education. However massive cuts in public expenditure in the 1920s and a general culture of hostility from parents and surprisingly employers significantly curtailed these crucial developments.

Only one authority namely Rugby operated a system of part-time continuing education on a statutory basis. It was only after the 1944 Education Act that these two proposals were reintroduced. The period between 1902 and 1939 witnessed the development of a mass secondary school system although it was only after the Second World War that it was completed. Colleges, many of which had been created from early developments i.e. Mechanics Institutes and Working Men's Colleges, developed slowly often dependent on the support of the local authorities. I will describe the development of the colleges in later chapters.

The trade unions still showed little interest in technical education outside the existing apprenticeship programmes. The reason for this reluctance seemed to stem from a fear that the unions would lose influence and their ability to control wages and conditions of service of their members when in employment. Also they were becoming increasingly suspicious of the developments that eroded trade and craft designations and boundaries and the concept of multi skilled workers.

The following tables illustrate the range of provision for technical education along with the enrolments in 1935 following the various Acts in the first few decades of the 20th century:

Students under 16 in England and Wales

Full time courses	No. of Students
Junior Technical Schools	22,158
Technical Day Classes	1,223
Total	23,381

Part time courses	No. of Students
Day Continuation and Work Schools	15,658
Evening Continuation Schools	205,648
Juvenile Instruction Centres	23,543
Technical Day Classes	2,077
Total	250,906

Students over 16 in England and Wales

Full time courses	No. of Students
Senior Courses in Colleges	8,709
Technical Day Classes	1,366
Total	10,165

Part time courses	No. of Students
Evening Classes in Colleges and Institutions	636,677
Technical Day Classes	23,350
Total	660,027

Source: Technical Education (Fabian Research Bureau, 1936)

Examinations

The history of the development of examinations especially in technical subjects inevitably mirrors the development of technical education itself i.e. a slow evolution often in a very ad hoc fashion. Again space does not allow full justice to be done to this complex and fascinating topic. I will just mention some of the more significant aspects of this area. Obviously it had been long recognised that assessments/examinations played an important part in the organisation of technical education. The examination system provided evidence of a student's achievement and the examinations gave the teachers syllabus and curricular frameworks to work to as well as providing comparative evidence of how technical schools and colleges were performing. Scotland as usual led the way with formal accreditation methods with the Ed-

inburgh School of Arts awarding certificates from 1835 to successful candidates after three years of attendance, which included classes in mathematics, chemistry and natural philosophy during the first year. In addition to these certificates which entitled students to life membership of the School 'attestations of proficiency' were awarded at the end of each annual course of lectures to successful candidates but only after a 'strict examination'. England only later developed examinations although the Society of Arts had recognised significant discoveries and inventions by awarding medals and money since its foundation in 1754. One major advocate of a general system of examinations was James Hole who was greatly influenced and impressed by the Edinburgh scheme (J. Hole, 'An Essay on the History and Management of Literary, Scientific and Mechanical Institutions', 1853). One vehicle used to introduce a wider system was via the unions of institutions that had been developing since the 1830s. These organisations had provided itinerant specialist teachers who attempted to compensate for shortages of specialist tutors. The unions were more successful in the north than in the south of the country and the Union of Lancashire and Cheshire Institutes, created in 1839, was an example of a union that developed an examination scheme. Hole, the secretary of the Yorkshire Union, proposed a nationwide Union of Institutes that came to fruition in 1856 when the Society of Arts and the London Union of Institutions established a system of examinations. Other Unions served the Midlands, the Northern Counties and others for the larger single Authorities such as the West Riding and Kent. These unions provided a complementary and valuable service to examinations offered by the CGLI and the Board of Education and drafted with the assistance of specialist advisory committees curricula and syllabuses and examined and certified candidates in their respective geographical areas. They examined candidates at evening continuation schools and at Senior and Advanced level studying in technical schools and colleges. The Unions did not cover all parts of the country and students outside their orbit took CGLI examinations in technical subjects whilst commercial examinations were offered by the Royal Society of Arts and the London Chamber of Commerce. There seems to be an interesting correlation between the establishment and subsequent strength of the Unions and the colleges in the industrial areas of England such as Cheshire, Lancashire and York-

shire. Courses reflected the particular industries in the immediate area and many argued that colleges should be given more autonomy in determining curricula and assessment. In fact the issue of local and central control became politicised during the first two decades of the 20th century, which reflects the wider debates of who manages and controls the colleges and schools.

The Mechanics Institutions did not develop any examination systems to any great extent but did help to establish a culture, which eventually led to their introduction and wider use.

At the end of the 19th century two central examining bodies still dominated the scene in regard to technical examinations namely the Science and Art Department and the City and Guilds of London Institution.

Examinations were inevitably offered in single subjects as the following table, which illustrates some of the subjects offered by CGLI in 1879:

Some subjects offered by CGLI in 1879		
Cotton manufacture	Gas manufacture	Porcelain and pottery
Steel manufacture	Silk manufacture	Photography
Paper manufacture	Carriage building	Silk dyeing
Glass manufacture	Telegraphy	Calico bleaching

Source: Reflections – Past and Future (CGLI, 2000)

As can be seen these reflect the major industries of the time particularly cotton which was for many years our greatest export but even so the take-up of these examinations was at a low level. The cotton industry like many others placed little reliance on technical education in order to develop and sustain a skilled workforce.

One of the most fascinating and important developments in the examination system of technical subjects arose out of a collaborative scheme between the Board of Education and a Professional Institution, (Institution of Mechanical Engineers) namely the ‘National Certificate Scheme’. This co-operation began in 1921 and certification was available to successful students in technical schools and colleges. The National Certificate awards proved a success and subsequently involved other Professional Institutions including the Institution of Electrical Engineers, Institute of Building, Institute of Chemistry and the Textile Institute. Analogous arrangements were developed for Commerce. The Board of Education and the Professional Institutions would determine the standard and range

of the subject content that would attract the award of the certificate. However they would attempt to allow the greatest degree of freedom to the school/college in terms of the organisation of the work and its assessment.

The success of the scheme soon saw the development of national certificates and diplomas across a wide range of technical subjects. Each provider would draft its own syllabus very often focussed on the needs of local employers and reflecting local industries. The syllabus would then be submitted to the Board of Education and the relevant Professional Institution for their approval. Once the course was approved successful candidates would receive a certificate or diploma according to the level of the course and/or the mode of attendance i.e. part or full –time. For example Ordinary Certificates (ONCs) were awarded after a three- year part –time course at a technical college whilst Higher Certificates (HNCs) were awarded after a further two years. Ordinary and Higher Diplomas (O/HNDs) required two and three years of full-time study respectively. The total number of O/HNCs awarded in 1931 was 2,792 rising to 5,330 in 1939. In 1939 the number of candidates for mechanical / electrical engineering and building was 1,833, 1,133 and 533 respectively.

During the late 19th and early 20th centuries the Professional Institutions introduced their own examinations e.g. Institution of Civil Engineering in 1897 and the Institution of Mechanical Engineering in 1913 respectively. In addition the universities and university colleges awarded qualifications in technical subjects although the latter could not award degrees. In spite of the increasing numbers of students pursuing technical subjects there was already a mismatch between supply and demand. Industry wanted qualified people but even during this period complained that the universities and other providers of HE were biased against vocational and technical subjects. Surprisingly there was also evidence in the 1920s/30s that there was also an imbalance in graduate science numbers e.g. a surplus of chemists and deficit of biologists – a problem that continues to this day in e.g. engineering, physics and mathematics. This reflects the eternal and continuing problems of developing more effective and efficient market intelligence methods and assessing more accurately the supply and demand equation. Finally it is interesting to note that of the 4,439 students in full-time technology courses in 1934 the vast majority of them went

into technical jobs and occupations i.e. research, testing and design as opposed to the production side of industry – another example of academic drift?

Interesting to note that the linkage between the new technical schools and colleges, City and Guilds of London Institute and industry began gradually to influence the pattern of industrial training during the period before 1914. A good example of this was the gas industry that developed a four-year programme for fitters comprising day release and external examinations operated by the CGLI. Although it must be said that the provision was mainly for supervisory and technical staff and not for manual workers and operatives.

In 1917 the Board of Education recommended the replacement of the junior certificates and other awards by the School Certificate Examinations Scheme. Universities were responsible for their operation and the Secondary Schools Examination Council was established to advise the Board. Thus was born the School Certificates and Higher Certificates often called the School Matriculation, which continued to be offered until their replacement in 1951 by 'O' and 'A' levels. These were by definition academic in nature with little technical content. I will continue discussing the development of the examination system in later chapters describing the developments with CGLI, the Regional Examination Unions, ONCs/HNCs and a number of vocational awards.

The interwar period

During the period between the World Wars the major factor suppressing the further development of technical education was a succession of depressions and as a result the lack of money to invest in expanding the education system. The expenditure by the Board of Education in 1938 was £51 million – the same as it was for the period 1921/22! High levels of unemployment during this period created little commitment to develop and sustain a skilled workforce – this has been a recurring issue throughout this country's history and its attitude to technical education.

During the interwar years the importance of technical education was continually stressed by government and other relevant parties but resulted in little sustained or meaningful action. The Board of Education appeared to encourage and cajole but the State, because of financial constraints or indifference towards technical subjects failed to establish a comprehensive national system for technical education. The result was that the country was still denied an adequate system for the provision of secondary education for all and most certainly had an ill-formed system for technical education when the Second World War broke out in 1939.

Chapters 7 and 8 will pick up developments after the 1944 Education Act, which reshaped significantly the technical education landscape.

Some important developments

- 1915 - Creation of a Committee of the Privy Council on Scientific and Industrial Research
- 1916 - Department of Scientific and Industrial Research
- 1918 - Haldane Report published setting out the relationship between government and research
- 1919 - University Grants Committee created
- 1926 Closure of Finsbury Technical College

Some relevant Parliamentary Acts, Committees and Reports

- Board of Education Consultation Paper 1909. Recommended the introduction of 'day continuation education' for school leavers.
- Secondary Schools Examination Council – School Certificates and Higher School Certificates introduced. 1917
- Lewis Report 1917. Proposed that the school leaving age be raised without any exemptions to 14 and this should then be followed by attendance at a day continuation school up to the age of 18.
- Education Act. (Fisher). 1918. Highly influenced by the Lewis Report-School leaving age raised to 14 and all young workers be granted right of access to day release. However this was not implemented until the 1921 Act.
- Unemployment Insurance Act 1920. Even though the Government were given powers to link benefits to training no national funding was made available and any developments were at a local level.
- Education Act (1921). Raised the school leaving age from 12 to 14.
- Education Act. (Hadow) 1926. 'Education of the Adolescent'
- Education Act 1936. School leaving age to be raised to 15- postponed by outbreak of war
- Report of Consultative Committee on Grammar and Technical High Schools (Spens). Recommended tripartite system of secondary education-implemented following the 1944 Act.

(Again refer to the more comprehensive chronology in Appendix 1 and the book list in Appendix 4)

The 1940s

Because of the flurry of parliamentary activities in the 1940s, 1950s and 1960s innumerable reports and acts were published many of which related to technical education. To do justice to this period, this chapter will focus on this critical time not only for the country but also for technical education. I will describe a number of topics and attempt to capture the essence and chronology of these reforms. As always the period is littered with missed opportunities, weak political leadership and lack of real understanding of industry and technical education.

Because of the depressions during the 1920s/30s and the subsequent limitations on public expenditure little development of technical education occurred. The local authority budgets were severely curtailed which had a negative impact on their spending on education and this was further exacerbated by the permissive and voluntary nature of the existing legislation for technical education. As has been said the heyday of the growth of technical education was witnessed in the last two decades of the 19th century when colleges were established in most major cities and the larger towns. During the next half-century stagnation set in and a depressing period of national neglect was apparent. Only after the recommendations of the 1944 Education Act, which was strongly influenced by the Hadow and Spens Reports, (were enacted), was there some evidence of progress.

The Second World War provided many harsh lessons for this country. The once workshop of the world was made to realise in very stark terms that it was massively dependent on the US through the Lend-Lease programme. Churchill's call '*Give us the tools and we will finish the job!*' was only realised by the vast amount equipment and other hardware that America provided throughout the conflict. This included the essential electrical components for such systems as radar that had been invented by our own few brilliant scientists. Industry was ill prepared for

the challenge that mass production presented. Lack of investment meant that the antiquated machines available were unable to quickly manufacture quality products. Britain was unable to build modern machinery and machine tools and this led to a major dependence on the US. The workforce was largely unqualified and massive shortages were highlighted across craftspeople, technicians and technologists. It is often said that the Second World War was a conflict in which physics figured significantly whereas the First World War exploited chemistry so it was inevitable that the future was about science. The Second War had shown the need for more highly qualified engineers, technologists, scientists as well as skilled craftspeople in the future. It was finally recognised that the country needed an organised system of technical education in order to realise this aspiration to create a well-qualified and skilled workforce. Urgent action was needed to improve the skill levels of the existing workforce as well as increasing the flow of highly qualified people into industry and commerce. The painful lessons learnt during the war were addressed by a succession of committees, reports and parliament acts.

1944 Education Act

This major Act mainly dealt with schools with a great deal of parliamentary time spent on the place of religion in the curriculum. However section 41 required Local Education Authorities to "secure the provision of adequate facilities for further education, for:

- Full-time and part-time education for persons over compulsory school age
- Leisure-time occupations, in such organised, cultural, training and recreative activities as are suited to their requirements, for any person over compulsory school age who is able and willing to profit by the facilities provided for that purpose"

Therefore the Act attempted to address the concerns highlighted during the war namely the inadequacy of:

- Provision of training for craftspeople, technicians and technologists
- Financial, human and physical resources for colleges
- Provision for adult education

The Act created a blueprint for the development of a national network of technical institutions.

Because of the continuing concern about technological education two committees were established chaired by Eustace Percy and Alan Barlow respectively both of which focussed on higher education. Percy was a visionary, passionate about the importance of technology and recommended amongst other things the creation of a few highly specialised technology institutions. This and other recommendations were only to be implemented much later. The Barlow Committee dealt with the supply of scientific workforce and it is interesting that it supported pure science rather than technical and technological prowess (academic drift again!). Although to be fair to Barlow had argued that a national system should be developed integrating schools, technical and technology colleges, universities and INDUSTRY – an aspiration still to be realised. It was only in 1956 in the White Paper ‘Technical Education’ picked up some aspects of the blue prints were picking up and some of Percy’s and Barlow’s recommendations were realised. The then Secretary of State of Education, David Eccles, was an exceptional Minister with vision who fought hard to create a coherent properly funded system of technical education.

Technical colleges

During the fallow period from 1900 up to the mid-1940s colleges existed in inappropriate accommodation, with poor equipment and no proper human resource strategies. They too often struggled to satisfy local industrial needs. Following the Act more precise definitions for tertiary, technical and further education were established with a basic structure that can still be recognised today. One positive aspect of this development was the wide-ranging consultations that occurred with the Federation of British Industries and the Trade Union Congress. A period of rapid development then occurred with

the opening of new technical and further education colleges.

As a result of these developments the number of employees released for part-time training had risen to 417,000 by 1957 – a ten-fold increase when compared with 1938 – but there was still a real lack of effective employer involvement in vocational training.

The Act reinforced the fact that the English education system was a “national system, locally administered” with all the resultant problems that implied and which would continue to impact especially for technical education. Although many elements of the Act produced lasting benefit others continued to fail to fundamentally address critical shortages of scientifically and technically trained people in industry.

Between 1944 and the mid 1950s the college sector started to become more differentiated and carried a range of titles including: technical college, college of technology, municipal college, or college of further education. At this time these 460 or so colleges offered mainly work at ONC/OND level with qualifications offered by CGLI, RSA, and GCE ‘O’ and ‘A’ boards. Colleges catered for both full and part-time students and some around 160 offered advanced level programmes e.g. HNC/HNDs and even some degree programmes. The range of students and provision was beginning to become very heterogeneous which presented later reforms with a number of challenges. In addition there were twenty regional colleges with over 50% of their students pursuing advanced level work involving part and full time study for HNCs/HNDs, professional qualifications and degrees - a good example of a comprehensive institution. Six national colleges offered advanced programmes in such subjects as foundry, food, rubber, refrigeration and fan technology, heating and ventilation. These were eventually merged with other HE institutions whilst Cranfield Aeronautics College only provided post-graduate technology education. Finally there were 135 art colleges, 4 agricultural colleges and 41 farm institutes many of which went on to become colleges.

Definitions of levels of technical education were used to both describe qualifications and names of institutions these being ranked: for technologists, technicians and craftspeople (sometimes referred to as operatives. Such a hierarchy inevitably has limitations and inherent dangers and mirrors the way this country likes to segment organisations and people e.g. academic verses vocational debates, Russell league and New Universities.

Vocational secondary education

Following the implementation of the 1944 Act the main providers of secondary technical education were in local education authorities that had adopted the recommendations of the Spens (1938) and Norwood Reports (1943) and established a tripartite system of schools i.e. Grammar, Secondary Technical and Secondary Modern Schools. Many of these enlightened authorities had over the previous three to four decades operated systems involving a local technical college incorporating a junior technical school and in some cases a junior trade school. After 1944 these were designated secondary technical schools that took successful 11+ pupils and offered a vocationally biased curriculum. The Ministry of Education, which had been established following the 1944 Act, identified these schools as being for a minority of able pupils who would benefit from a technical or commercial curriculum. However in the end very few were created. Quite quickly the curriculum mirrored that of the grammar schools – another classic example of academic drift! Secondary modern schools were left to develop their own appropriate curriculum. (A personal aside. I was a pupil at such a school having failed the 11+ twice – the curriculum was not examination led but I experienced a rich range of provision including the crafts taught by great teachers many of whom had been emergency trained after the war). The Crowther Report in 1959 stated that the country did not have a tripartite system but a two-side system. Crowther was particularly interested in those pupils for whom a more vocational and practically focused curriculum would be more appropriate.

Industrial Training

Despite the emphasis on reforms of further and higher education, vocational training was still left very much in the hands of industry and the benevolence and support of a number of committed employers. Increasing concern was expressed about this situation throughout the immediate post-war years and the establishment of National Apprenticeship and Training Councils serving individual industries was advocated. Interesting to note this meant a re-adoption after 16 years of the conclusions of the Balfour and Malcolm Committees! These calls were finally supported by two pieces of legislation namely 'The Industrial Organisation and Development Act' (1947) and 'The Employment and Training Act' (1948). In-

evitably neither Act had much impact on vocational training in industry, and by the end of the 1940s the continuing concern about leaving industrial training to employers was gaining momentum. However successive governments failed to recognise the fundamental weaknesses in the voluntary arrangements and continued to adhere to the policies formulated in 1945. During the early 1950s the concerns grew about the poor state of the skill levels in the workforce and culminated in 1958 with the report 'Training for Skill' chaired by Robert Carr the then Parliamentary Secretary to the Ministry of Labour. The central theme of his report was about apprenticeships for craftspeople and recommended that the government expand and improve facilities for technical education BUT that the responsibility for industrial training remain with employers. The report called for a non-executive Council that endeavours to 'help, encourage and if necessary exhort employers to improve industrial training'.

As one can imagine the report attracted a great deal of criticism both for its concentration on craft training and the lost opportunity to introduce a compulsory instrument. Many argued, including the British Association for Commercial and Industrial Education, that what was needed was a national strategy for workforce planning for all training programmes and that a compulsory levy be imposed on employers. Only in 1964 did the government accept the failure of the voluntary approach which brought about a reversal of a policy that had been obstinately upheld for over 17 years leading to the White Paper 'Industrial Training – Government Proposals.' The White Paper was supported by all political parties and both sides of industry and became law and resulted in the creation of the Industrial Training Boards (ITB) representing particular industries. Each Board would approve courses/qualifications including those run in colleges that would receive training grants and a Central Training Council would be established to oversee the adequacy of provision. However as will be seen in later chapters the levy imposed on employers was to cause problems particularly for small and medium size companies. Employers would only receive a grant if their companies provided approved training programmes for their employees. ITBs were the precursors of a multitude of employer-led organisations that would be created over the next four decades with the responsibility to set occupational standards and maintain employer involvement in

industrial training and qualifications. These have included Industrial Lead Bodies (ILBs), Lead Bodies (LBs), National Training Organisations (NTOs) and the latest attempt the Sector Skills Councils (SSCs) all of which have largely failed to improve the situation.

Industrial Training - International Comparisons

Three basic models can be identified when comparing our industrial training with those of our main international competitors namely:

■ The free market model

Large companies in America and Japan provide this and various versions of it. Private funding and organisations predominates with two models involving in company training and private training colleges and institutes.

■ The interventionist model

France mainly operates this approach in which public funding through taxation and public organisations predominates, with legal institutions of training rights and duties.

■ The corporatist model

Germany mainly operates this approach in which there is joint public and private funding through tripartite delivery systems within a framework of nationally agreed procedures and standards.

These approaches clearly identifies and defines where the funding for the training comes from and who is responsible for the training initiatives. Britain has tried all three of these models but all without success. Failure was due to lack of funding or the inability of the various partners to agree the overall strategy and direction of the training. Government continued to be reluctant to intervene in such activities preferring to operate a voluntary set of codes or practices. Companies still did not see training policy as a possible managerial tool to improve skill levels in their workforce, increase productivity and competitiveness preferring to leave it to colleges and other training providers to provide their workers. It was a classic cocktail of often contradictory, opposing and paradoxical features e.g. the free market, voluntarism, partial compulsion etc. Another contributory factor was the absence of a tradition for individuals to self-finance their pre-employment training in vocational and training institutions. The participation rate in part-time courses, night classes etc has always been much lower in England than say in America or Germany where individuals accept that they have to fund part or all of their studies. This country has created a tradition that schools provide 'education' whilst employers provide 'opportunities for training' although for most of the period of this history employers did not provide opportunities. Sadly the evidence again reinforces the fact how poorly we compare with our competitors in training and technical education.

Important dates:

- 1947 School leaving age raised to 15
- 1951 GCSE at O and A level introduced
- 1955 National Council for Technological Awards

Some relevant Parliamentary Acts, Reports, Committees and Commissions

- White Paper on Educational Reconstruction 1943
- Secondary School Examinations Council on Curriculum and Examinations in Schools (Norwood) 1943. Supported tripartite structure for schools
- Education Act (Butler) 1944
- Report on Higher Technological Education (Percy) 1945 - recommended upgrading of a number of technical colleges to colleges of advanced technology
- Committee on Scientific Manpower (Barlow) 1946 – advocated a doubling of scientists in universities over a ten year period

- Industrial Organisation and Development Act 1947 – establishment of Councils in certain industries with functions to "promote the training of persons engaged or proposing engagement in the industry"
- Employment and Training Act 1948 – largely focussed on issues with youth employment
- White Paper on Technical Education 1956 – creation of colleges of advanced technology; regional colleges to cater for day release students
- Report of the Central Advisory Council 15 to 18 (Crowther) 1959
- Industrial Training Act 1964

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The 1950s and 1960s

Following the publication of the White Paper ‘Technical Education’ in 1956, technical education experienced a number of changes including the eventual designation of ten Colleges of Advanced Technology (CATs), which were to represent the apex of technical education. The lower levels of work were shifted to local colleges. CATs were eventually removed from local authority control and following the Robbins Report (1963) were designated universities although not surprisingly not many used the word technology in their title. The main qualification studied was the degree equivalent Diploma of Technology. It is interesting to note that CATs were established a decade after Percy recommended their creation and over a century after similar institutions were established in Germany and other European countries. A parallel expansion occurred in the FE sector with a period of sustained capital investment to begin to improve accommodation and equipment in colleges. There were some interesting transitions in the attendance modes of students with fewer evening part-time numbers and an increasing number of day part-time students. Also many school leavers particularly those from secondary moderns, (I was one of them) went to their local colleges to take a variety of examinations by full-time study including CGLIs, RSAs, other trade and craft courses and ‘O’ and ‘A’ levels. The seminal White Paper ‘Better Opportunities in Technical Education’ placed a greater emphasis on provision for technicians, craftspeople and operatives. The White Paper had four primary aims namely:

- To broaden the education received by students and provide continuity between school and college

- Provision at colleges to be better matched to the needs of industry and to urgently improve facilities for technicians
- Increase the range of courses to suit the needs and ability of the students
- Tackle the high failure and wastage rates experienced by students.

Some of the chief proposals were:

- Preliminary courses in evening institutes be discontinued and students should start at a college immediately after leaving school
- Improvement in selection procedures and colleges should PILOT induction courses and tutorial methods (where have we heard that before!)
- ONC courses should last two years instead of three
- Courses for technicians, craftspeople and operatives should be reformed and extended in range and scope
- New courses known as General courses (designated by G and the year of study e.g. G1, G2 etc.) that allowed progression on to Technician course (T courses)
- Development of more day release courses and students should not have to rely wholly on evening study
- Sandwich and block release courses should be increasingly developed.

G courses were designed for school leavers who had potential to qualify as technicians and undertaken by part-time or by block release study. Successful completion of a G course would allow progression onto an ONC or to the second year of a T course. G courses were externally administered by the CGLI and the six

Regional Examining Bodies (REBs). Courses were offered in a number of subjects including construction, engineering, mining, printing, science, and textiles. Table 1 shows the enrolments for G courses in 1963 and 1968.

T-Courses

There were two types of T-courses namely: “End-on” and “Ab Initio”. In 1961 there were 23 ab initio and 26 end-on courses running in such subjects as building, electrical engineering, mechanical engineering, the utilities and furniture. These courses had no age restriction for study and special arrangements were

made for mature entrants e.g. they could study single subjects.

Ab Initio courses were designed for particular occupations and required two years full time study or part-time study over four years and opportunities existed for progression onto higher qualifications. There were just two such courses in 1961 but by 1968 this had grown to 90 involving thirteen occupational areas. The range of subjects approved by CGLI was remarkable, spanning such areas as; mining/quarrying, food technology, metal manufacturing, engineering specialisms, automotive, building, textiles and even programmes in photography, computing and techni-

Table 1 – G Courses: Number of Candidates and Number Qualifying for ONC and T2

	1963			1968		
	No. Entered	Qualified for ONC1	Qualified For T2	No. Entered	Qualified For ONC1	Qualified For T2
Construction	-	-	-	1,950	722 (37%)	756 (39%)
Engineering	15,454	3,942 (26%)	6,080 (39%)	11,423	4,216 (37%)	4,174 (37%)
Mining	-	-	-	503	211 (42%)	171 (34%)
Printing	-	-	-	236	55 (23%)	77 (33%)
Science	-	-	-	1,501	595 (40%)	432 (29%)
Shipbuilding	-	-	-	63	11 (17%)	14 (22%)
Textiles	18	2 (11%)	8 (44%)	116	57 (49%)	33 (28%)
Totals	15,472	3,944 (25%)	6,088 (40%)	15,792	5,867 (37%)	5,657 (36%)
Total qualifying		10,032 (65%)			11,524 (73%)	

Table 2 – Number of Candidates and Pass Rates for ONCs and ONDs

		ONC		OND	
		1963	1968	1963	1968
Building	entered	3,771	2,630	341	499
	passed	2,292	1,632	224	365
Mechanical Engineering	entered	19,017	None	491	None
	passed	9,082	None	284	None
Electrical Engineering	entered	9,523	None	31	None
	passed	5,260	None	19	None
Engineering	entered	None	15,261	318	1,637
	passed	None	9,452	218	1,107
Metallurgy	entered	761	None	None	None
	passed	424	None	None	None
Mining and Surveying	entered	832	191	None	None
	passed	493	128	None	None
Total all subjects	entered	38,702	22,731	1,181	2,444
	passed	20,067	14,136	745	1,683
Overall pass rate		51.8%	62.2%	63%	68.9%

cal illustration. In 1967 there were 105,734 candidates registered with CGLI and the REBs with a pass rate of 66.1% (69,874 students).

I have presented this rather detailed set of data and brief analysis to illustrate the overall state of technical education by the 1960s. The tables reflect the decline of traditional industries such as textiles and ship-building and the relatively slow growth in the new technologies. The decline in ONCs can be identified with the introduction of the T-courses. But in spite of these worthy developments the overall picture was somewhat depressing. One aspect of these concerns was picked up by The Dainton Committee (1968) addressing the declining numbers of students entering HE in science and technology.

Another depressing fact was that the overall participation and pass rates remained stubbornly low. It was a critical time for this country, two decades after the war with the continuing decline of our traditional industries and the slow response to recognise the importance of new manufacturing and management techniques. Overseas competition was increasing from such countries as Germany and Japan. England still lacked the necessary critical mass of a well-trained, skilled and adaptable workforce at all levels of industry and manufacturing. Real evidence was emerging of our continuing low levels of

productivity, declining industrial competitiveness, skill shortages and industrial poaching within the small stock of competent workers and this all coupled with increasing numbers of school leavers. After the 1944 Act the main responsibility for technical education had fallen almost by default on colleges. In hindsight they never received the level of sustained investment that was necessary in order to compensate for decades of neglect. Little evidence exists to show that employers offered in-company training programmes but recruited directly from universities, colleges, schools or poached workers from other companies. The majority of school leavers still opted for the narrow academic curriculum personified by A levels which contributed to the low participation levels in technical subjects and the low value placed on technical education by parents and young people. It must be remembered that when GCE 'A' levels were introduced in 1951 they were meant for only for about 1% of students entering the sixth form. To be fair other factors contributed to this low participation level; poor careers advice in schools, lack of maintenance grants for college students and the supposed high status of the academic sixth form. The majority of school leavers still entered jobs that offered no formal training, and those who did receive training embarked on apprenticeship programmes.

Table 3 – Number of Candidates and Pass Rates for HNCs and HNDs

		HNC		HND	
		1963	1968	1963	1968
Building	entered	1,740	3,275	144	377
	passed	1,335	2,784	122	337
Mechanical Engineering	entered	6,241	5,174	675	1,241
	passed	4,040	3,416	586	1,035
Electrical Engineering	entered	4,461	5,250	278	756
	passed	2,833	3,024	209	603
Production Engineering	entered	761	1,034	34	152
	passed	608	845	32	141
Civil Engineering	entered	811	680	None	None
	passed	572	518	None	None
Metallurgy	entered	379	303	33	76
	passed	298	243	31	65
Textiles	entered	75	31	None	18
	passed	69	27	None	18
Total all subjects	entered	17,462	19,551	1,398	3,243
	passed	11,574	13,496	1,165	2,670
Overall pass rate		66.3%	69%	83.3%	82.3%

In 1964 only 240,000 school leavers undertook apprenticeship training but these programmes were increasingly becoming outmoded and inappropriate for the latter half of the 20th century. Weaknesses included questionable age and gender criteria for entry, often the absence of proper off-job training but the main criticism was the rigidity of the programmes that required long and inflexible attendance periods of training before qualifications could be gained. The negative effects of this timeserving regime have only recently been highlighted. The impact and ultimate value of the apprenticeship system, that has been the mainstay of British training, has been consistently questioned and criticised during the last half of the 20th century. One aspect of this valid criticism was the consequences of the historical definition of “skill” adopted by this country. The definition not only restricted the number of trades involved in the apprentices but also largely excluded females. However it has only recently been recognised and accepted that apprenticeships must be governed by effective national standards of competence and proficiency, that apprenticeship programmes must recognise the different abilities of trainees, and that flexibility needs to be part of the training framework. As a result of the major transitions and resultant changes in industrial and manufacturing processes/techniques from the mid-50s apprenticeships and other training programmes must have recognised and included issues associated with multi-/up-/cross-skilling (sorry about the use of such jargon). Recent reforms of the apprenticeship system have at last begun to address these serious defects and will be considered in later chapters.

The White Paper ‘Better Opportunities in Technical Education’ stands out as a seminal piece of legislation that made a number of positive recommendations which added impetus to the development of technical education but as usual it was too little too late. One positive consequence during this time was the recognition by the professional bodies and the Council of Education Institutions (CEI) of the need to classify the skills needed by industry. In addition the CEI clarified progression routes for professional status for engineers. The Haslegrave Report (1969) on ‘Technician Courses and Examinations’ advocated amongst other proposals a greater coherence between the technician, the technician engineer and the chartered engineer. Following the implementation of the Haslegrave proposals Ordinary and Higher certifi-

icates and diplomas, G and T courses were replaced by Technician Education Council (TEC), Business Education Council (BEC) and Design and Art Education Council (DATEC).

Regional Advisory Councils, Inspection Methods and other organisations associated with technical education

After the 1944 Act a number of Regional Advisory Councils (RACs) were established in 1947/8 - nine in England and one in Wales to co-ordinate the provision of further education in different areas of the country. They were established and funded by local education authorities. Their remit was to advise LEAs and their constituent colleges on the further education needs required in their regions and to encourage cooperation between colleges to reduce duplication of provision. The Councils would regularly review provision to identify skills gaps in their areas and would consider and approve higher-level course applications from colleges e.g. HNCs/HNDs. They also were required to create advisory committees and other forums to exchange ideas among colleges, employers and universities as well as staging conferences, seminars and staff development programmes. A number organised and made provision for examinations in conjunction with the REBs. Inevitably the bureaucratic course approval structure attracted a great deal of criticism and generated friction between the colleges and LEAs because of mismatches between local/ individual interests and educational judgements. Polytechnics argued quite rightly that they were serving a national catchment and should not be subjected to regional criteria. Having worked with three different RACs I experienced first hand the frustrations in getting approval for new technician and HE programmes. Looking back the influence of these Councils was very mixed with a number of positive benefits but at times they manifested great inertia. The role of the RACs was to change significantly during the following decades particularly following the Oakes Report (1978) and the creation of other national management funding bodies e.g. FEFC and LSCs.

The college’s work was inspected by Her Majesty’s Inspectorate (HMI) and comprised both subject specialist and generalist inspectors supported by a General College Inspector and a Regional Staff

Inspector. I remember with great pleasure the supportive and professional attitude these people possessed, a far cry from their successors e.g. FEFC, ALI, OfSTED and QIA.

The CBI did not take an effective role in influencing national training policy as it lacked the power to compel employers to improve their investment in training. Its stance was very much based on non-intervention and supported voluntary and free-market philosophies. Indeed a senior member of their Education Directorate in 1986 openly stated, “that any legislation to compel changes in training policy was perceived as constituting an intolerable financial burden on industry.”

The CBI did not have many members representing small and medium sized companies who were often unable to fund training and prone to poach-

ing other companies’ employees and the real power anyway still resided with individual employers to develop effective training practices. The TUC like the CBI was limited in its ability to influence government policy and to enforce centrally negotiated policies on member unions. The unions were preoccupied with overseeing the multitudinous complex of confusing and un-coordinated collective bargaining arrangements for whole industrial sectors down to small elements within companies. The Chambers of Commerce also manifestly failed to create a particularly effective local employer network lacking as they did the powers given to their counterparts in Germany.

The next chapter further consider the impact of these earlier developments and the plethora of initiatives in the 1970s and 1980s.

Some important developments

- 1955 National Council for Technical Awards established eventually became the Council for National Academic Awards in 1964
- 1960 Beloe Report recommended the creation of the Certificate of Secondary Education (CSE)
- 1963 CATs become universities after the Robbins Report
- 1964 Department of Education and Science replaced Ministry of Education
- 1964 Schools Council for Curriculum and Examinations established following Lockwood Report
- 1966 Polytechnics created from regional and the larger area colleges

Some relevant Parliamentary Acts, Committees and Reports

- White Paper ‘Technical Education’ – recommended hierarchy of technical colleges local/ area/ regional and the creation of CATs 1956
- White Paper ‘Better Opportunities in Technical Education’ - proposed major changes of courses in technical colleges for technicians, craftspeople and operatives 1961
- Committee on Higher Education (Robbins) – recommended creation of new universities and CATs to be designated universities 1963
- White Paper ‘A Plan for Polytechnics and Other Colleges’ – created the foundations of the binary system for polytechnics and universities 1966
- Science and Technology in Higher Education (Dainton) – attempted to address the reduction of students studying science and technology 1968
- Education Act –proposed comprehensive schools 1968
- Report of the Committee on Technician Courses and Examinations (Haselgrave) – recommended the establishment of TEC and BEC 1969

(See Appendices 1 and 4 for the chronology and book list that provides more detailed information about key Acts, publications and initiatives)

Chapter 9

1970s

Industrial training and the rise of quangos

Although the existing apprenticeship programmes continued to be the main vehicle for industrial training they urgently required reform. In addition to the weaknesses highlighted earlier the craft unions exploited them for entry into their then highly demarcated trades. Employers sadly valued them for providing cheap labour and relieving the burden of training costs.

Following the 'Industrial Training Act', 27 statutory Industrial Training Boards (ITBs) were established between 1964 and 1969 but only after six years. In spite of some real progress, pressure for reforms was growing especially from small companies. These concerns were of such a magnitude that they attracted attention in the 1970 General Election with the Conservatives arguing for a major review of the 1964 Act. The Conservative Party subsequently published a Green Paper 'Training for the Future – A Plan for Discussion' in 1974, which carried a foreword by Robert Carr the then Secretary of State for Employment. The Paper acknowledged the achievements of the ITBs (the volume of training had increased by 15 % between 1964 and 1968) but argued strongly that weaknesses in the system must be addressed and actioned. The original paper was significantly altered following wide consultation with amongst others the CBI and the TUC – interesting to note their involvement and influence on the government on this occasion – a rare occurrence! When the 'Employment and Training Bill' was enacted in 1973 it led in 1974, to the creation of the Manpower Services Commission (MSC). The MSC included two executive bodies namely the Training Services Agency and the Employment Services Agency. The Act introduced limits on the ITBs to raise levies, imposed exemptions from levies for companies whose training programmes met specific criteria and transferred operating costs

from industry to the public purse. The MSC was a tripartite quango funded by the Department of Employment. The MSC had a major impact on technical education having as it did a central overall responsibility for the co-ordination of public employment and training services including a significant funding role for the ITBs. The early 1970s witnessed the first oil crisis and during the following prolonged recession the government reined back public expenditure. The MSC's budget increased from £ 125 million in 1974/7 to £641 million in 1978/79 concentrating instead only on temporary employment schemes, largely ineffective work experience programmes and short duration training schemes all of which were poorly evaluated and overall did not improve skills levels. This was a classic example of political expediency and the operation of the city mentality namely short termism – the quick fix approach ruled ok! The MSC schemes spawned a plethora of acronyms – the alphabet soup as it was later referred to. The first programme was the Training Opportunities Scheme (TOPS) followed later by the Youth Opportunities Programme (YOP) – notice the title scheme – behind every scheme there are schemers? In 1976 the MSC and the DES joined forces to create the Unified Vocational Preparation (UVP) scheme targeted at school leavers entering work, for whom training had not previously been provided. This worthy initiative had little impact and did not even progress beyond its pilot stage although it did provide a basis for later developments.

These initiatives had placed the state centre stage for the Thatcher government to bring in some major reforms in education and training. The first half of her administration (1979-81) witnessed a multitude of changes including the dismantling of the ITBs and by the late 1980s their number had declined to eight although a number survived including the Boards representing Engineering (EITB) and Construction (CITB).

Other agencies

In 1978 the Department for Education and Science (DES) established the Further Education Curriculum and Development Unit – later to be referred to as the Further Education Unit (FEU) which as the original title suggest produced a series of publications to support colleges to improve their curricula with a greater emphasis on vocationalism. The FEU had a number of aims - review the FE curricula by identifying duplication, overlap and gaps in provision, set priorities to improve provision, carry out research with other bodies to develop the FE curricula and to disseminate information on curriculum development. The FEU initially focussed on the need to improve the transition from school to work for the majority of school leavers who still did not receive any further training through attending colleges. Therefore much of the Unit's efforts centred on 'vocational preparation' emphasising the need for student-centred approaches for this new student population. One FEU publication was highly regarded namely 'A Basis for Choice' (ABC).

Students

As a result of these reforms the pattern of destinations for school leavers changed dramatically. This was a period of high youth employment where the majority of companies continued to offer little or no formal training. However from the late 70s as a result of the significant decline in the youth labour market and the emergence of MSC schemes e.g. YTS, the post-school destinations changed. Table 1 illustrates the percentage for the 16, 17 and 18 year-olds in 1973 and 1980.

The figures indicate some interesting trends e.g. the growth in FE for 16 year-olds, the decline of employment at 16 and the continuing and depressingly low participation rates in education. There were continuing concerns during this period that the majority

Table 1 – Destination of 16, 17 and 18 year-olds in 1973/74 and 1980/81

	16 year-olds		17 year-olds		18 year-olds	
	1973/74	1980/81	1973/74	1980/81	1973/74	1980/81
Schools	27	28	18	18	2	2
FE	9	14	8	10	7	5
HE	0	0	0	0	6	8
YTS	0	9	0	4	0	1
Employment	61	38	70	55	82	71
Unemployment	3	12	4	13	3	13

Source: DFE Statistical Bulletins 1995

of young people enrolled on academic subject full-time courses in schools and colleges with a marked reluctance to undertake practical and technical studies coupled with a high dropout. I will continue to describe these trends in later chapters.

Table 2 – Enrolments as Percentage of 14-25 Age Cohort in 1931 and 1951

	1931	1951
Day students (000s)	35.8	318.5
Evening students (000s)	906	1,901
Total cohort population (0000s)	6,929	5,612
Full time participation rate	0.52	5.68
Part time participation rate	13.1	33.7

Table 3 – Index of Expansion in Student Numbers for 1931, 1947 and 1951

	1931	1947	1951
Full time day	100	422	471
Part time day	100	634	983
Total day	100	584	888
Total evening	100	141	210

Table 4 – Proportions on Different Categories of Subject

	1931	1947	1951
Vocational	13.0	15.0	15.3
Professional / Commercial	21.1	16.0	15.2
Total V/P/C	34.1	31.0	30.5
Academic total	34.5	26.3	20.9
Recreational	28.6	42.7	48.6
Total	100	100	100

Table 2 attempts to illustrate how participation rates have grown for the age group 14 to 25 between 1931 and 1951. It is important to note that population figures include Wales.

Table 3 shows the Index of Expansion in Student Numbers for 1931, 1947 and 1951. To make comparisons easier I have assigned an index of 100 for 1931. The expansion indices speak for themselves but remember the figures indicate total enrolments and do not differentiate between technical, academic and recreational classes. Data is difficult to analyse but table 4 attempts to show enrolments across these categories for the same years.

Notice that the proportion for vocational subjects remained fairly static at around 15% and about 33% if you factor in Professional and Commercial subjects.

As can be seen most of the expansion in evening classes was in non-vocational provision i.e. leisure and recreational programmes.

Teachers

In 1934 there were 3,854 full-time teaching staff in FE divided between those teaching such subjects as science, mathematics and modern languages and those with industrial training and experience who taught the technical subjects. These were ably supported by about 10,000 part-time teachers mostly drawn from industry and commerce. Technical education from the earliest times benefited greatly from part-time instructors/teachers bringing with them relevant and up to date awareness and knowledge of industrial techniques. One recurring criticism of colleges from successive inspection reports is that many full-time staff have little or no real experience or up to date experience of relevant industries. The majority of these staff entered technical education straight from full-education or from industry years before. By 1977 the numbers had risen to approximately 77,000 (15,400 in Polytechnics) for full-time staff supported by 130,000 part-timers all employed by the LEAs in Polytechnics, FE Colleges and Adult Institutes. Statistical comparisons are difficult during this time because of the increasing numbers and changing pattern of institutions e.g. Polytechnics/Colleges of Education/Colleges of Higher Education but the figures at least indicate the massive growth in staff numbers over this period.

Prospective FE teachers could receive training in five specialist colleges, four in England at Bolton, Garnett, Huddersfield and Wolverhampton. Wales and Scotland also had their own colleges of Education (Technical). Others entered the FE sector directly after taking degrees some with Post Graduate Certificates although it must be remembered that teachers were not required to have Qualified Teaching Status as in the schools. Others entered colleges after working in industry bringing initially a valuable insight into industrial practices. Some full-time and part-time teachers studied the CGLI FE Teachers Certificates e.g. 730, that conferred qualified teacher status (QTS). This was sometimes taught in the colleges. During this time a number of key reports were published which considered FE teacher training including Russell (1966) and the three reports by Haycocks (1977). Although not all the recommendations of these reports and the subsequent circulars

were implemented it was a start in improving the quality of teaching in FE which numerous inspection reports had said was adequate but often uninspiring.

The FE and HE landscape in 1970 and 1980

1970	1980
Universities (45)	Universities (45)
Colleges of Education (Approx. 155)	Colleges and Institutes of HE (Approx. 70)
Polytechnics (30)	Polytechnics (30)
Further Education Colleges (Approx. 700)	Further Education Colleges (Approx. 500)
Evening Institutes (Approx. 6,500)	Evening Institutes (Approx. 5,300)

Shaded sections denote the FE-LEA funded sector

The pattern of FE and HE is shown below in Figure 2. Important to note that Polytechnics were only given autonomy from LEAs in 1988 and ultimately became universities.

Technician courses and examinations

In 1967 the Secretary of State for Education and Science invited the National Advisory Council on Education for Industry and Commerce (NACEIC) to review technician provision including examinations. The NACEIC felt that the developments since the White Paper 'Better Opportunities in Technical Education' e.g. the Industrial Training Act, the work of the CNAA and the changing purpose of the higher national courses, merited such a review. A Committee was established chaired by Haslegrave and published its report in 1969. Its remit was: "to review the provision for courses suitable for technicians at all levels (including corresponding grades in non-technical occupations) and to consider what changes are desirable in the present structure of courses and examinations." The Committee considered national courses leading to technician and comparable certificates of the CGLI, the six REBs, Ordinary and Higher National awards and the General courses. The Committee did not regard individual college courses or those leading to examinations of professional and similar bodies as part of their remit but did consider their possible impact and relationship on their final recommendations. After wide consultations the Committee recommended the creation of two Education

Councils namely the Technician Education Council (TEC) and the Business Education Council (BEC). TEC had the following terms of reference: “To plan, administer and keep under review the development of a unified pattern of courses of technical education for technicians in industry; and in pursuance of this to devise or improve suitable courses, establish and

assess standards of performance, and award certificates and diplomas as appropriate.” BEC had a similar set of terms of reference. The Secretary of State accepted the Committees’ recommendations and so TEC and BEC were born. These proposals were to have a profound effect on the way colleges operated and managed technical education from then on.

Some important developments

- 1972 School leaving age raised to 16
- 1976 Callaghan’s Ruskin Speech – initiated the so-called ‘ Great Debate’ but only focussed on schools and universities with no consideration of FE
- 1978 YOP introduced
- 1978 ‘A Basis for Choice’ published – recommended provision of non-specific vocational courses in schools.

Some relevant Parliamentary Acts, Committees and Reports

- Report on ‘ Scientific and Engineering Manpower in G.B’. 1957
- Report on ‘The Supply and Training of Teachers for Technical Colleges’ (Jackson) 1957
- Report on ‘Training Teachers’ (James) – recommended professional training for FE staff and the introduction of a new qualification Diploma in Higher Education (Dip HE) 1972
- White Paper ‘Education: Framework for Expansion’ – responded to the James Report 1972
- Employment and Training Act - MSC created 1973
- Flow into Employment of Scientists, Engineers and Technologists (Swann) 1974
- Report ‘Training Teachers in FE’ (Haycocks) 1975

Chapter 10

The 1980s

So far this short history has attempted to show how technical education has evolved along with the associated systems and surrounding infrastructures since the late 18th century. The picture that has emerged is one of a fragmented and uncoordinated landscape possessing unnecessary complexity and lacking any real coherence. Even when progress occurred it often depended critically on the efforts of a relatively small number of visionaries and philanthropic individuals. The history unfortunately reflects a catalogue of false dawns and raised expectations that were seldom realised in spite of the opportunities that had been created by such individuals or by the prevailing political, financial or social climate e.g. at times of recession or wars. The continual reluctance of political parties to intervene and recognise the importance of technical education as a way of increasing productivity and reducing skill gaps and shortages also contributed to the parlous state of this strategically important sector. Employers in this country, in stark contrast to our major competitors, continually failed to invest in training preferring to take people direct from college or university or to poach employees from other companies –after all they argued it was cheaper! The organisations that represent the employers and employees namely the CBI and the TUC continued to have little influence on government policy. In-house company training was limited to a relatively small number of industries e.g. automotive (Ford/ Rover), aerospace (BAE), with the employers arguing that they already contributed to the funding for state education via the tax system.

Manpower Services Commission (MSC)

It was only with the creation of the Manpower Services Commission (MSC) that the first attempt to develop a national labour market and training policy

occurred. However it became very clear when the state eventually became involved that the government departments e.g. Employment, Education, Trade and Industry or the Treasury possessed little empathy or understanding of industry and this weakness continues even today. In 1986 the MSC reached its apogee with an annual budget of £3 billion and responsibility for a massive range of programmes spanning training, upskilling employed and unemployed adults and young people. The extensive empire included Information Technology Centres, Centres for the unemployed (TUC sponsored), Adult Training Centres etc. However most of the programmes were aimed at the lower skill levels and/or youth unemployment and perpetuated the culture of the low skills equilibrium. Therefore the initiatives failed to create the comprehensive set of programmes to tackle the problems associated with skill gaps and shortages at both low and higher levels of the skills spectrum. These coupled with other factors highlighted in earlier parts of this series meant that technical education was never given the status it deserved and failed to achieve the critical mass that was so necessary to create a coherent national system. The period during the reign of the MSC has often been referred to as ‘training without jobs’ meaning it was a political ploy to keep people off the unemployment registers and make the government look good in regard to youth unemployment. In retrospect many of the schemes/initiatives had been created without any real thought about their purpose and their ultimate outcome and consequences on the labour market. For example little attention was given to the fitness of purpose between the qualifications being pursued, the experience gained on the programme and the needs of the work place. Eventually all this investment and apparent interest in technical education and training began to wane and the power and influence of the MSC declined. The climate shifted back to the traditional academic approach and the investment in

work based training declined as politicians expanded the so-called academic route of A levels and degrees. The MSC was abolished in 1988 and replaced by the Training and Enterprise Councils.

Technical education had still failed to achieve comparable status and recognition with that of the university and school sectors and as a result was still seen as second class and for the less able. A great deal of rhetoric was expounded during the 1970/80s about establishing parity of esteem between vocational qualifications and general qualifications and to create equality between colleges, schools and university sectors but to little effect. Such debates still continue but without success – examples abound including Higginson ('87), Dearing ('94/97), British Baccalaureate ('90), Tomlinson (2005). The local authorities were not really interested in developing many of the reforms advocated by central government especially those in the vocational areas. This reluctance coupled with the general indifference shown by many teachers and teaching unions to introducing technical/vocational elements into the post-14 curriculum further impeded the development of reducing let alone removing the vocational/academic divide e.g. the Technical Vocational Education Initiative (TVEI). The TVEI, (1983), was aimed at introducing vocational subjects into schools and developing effective partnerships between schools and colleges – it promised much but ultimately failed because of the high cost. The cost of introducing the initiative across all schools/colleges with adequate and sustained funding would have been immense so it was inevitable that TVEI would just remain as a pilot scheme. The government realised that it could not fund a fully-fledged TVEI so decided to develop a few institutions namely City Technology Colleges (CTCs) which were supposed to transform vocational studies at school level. The creation of the CTCs from 1987 established a new structural and funding model that has continued to this day, namely, to create and fund a few flagship institutions. Politically and financially the approach makes sense but does nothing to increase the volume of technically qualified people into employment. Obviously fewer institutions require less funding and then allows the government of the day to micro-manage these so called centres of excellence and then crow about their attempts to improve technical and vocational education. This model created by the Conservatives has been fully embraced and extended by New Labour. Examples currently include special-

ist schools, city academies and COVES (Centres of Excellence in Colleges and training organisations). The main problem with this cherry picking approach is that it is too little and too late and cannot hope to create the critical mass that is so urgently required to address skills gaps and shortages. It is adequate funding that creates excellence of provision and not just fancy titles outside institutions. Adequate and sustained funding that recognises the true cost of specialised programmes and subjects allows state of the art equipment, facilities and accommodation to be developed. Equally important is to have highly qualified teaching and support staff with up-to-date qualifications and experience. Research will no doubt show that it is the level of funding that is critical and NOT grandiose institutional titles and political whims based on narrow and ill informed political dogma.

The relatively small growth in the scale of technical education and training since the mid-40s did not compensate for the decades of neglect. As mentioned before the FE sector had become the major provider of technical education and training by default and was often referred to as the Cinderella sector of education. Although the local authorities had responsibility for the colleges many did not exercise their duties in developing them, preferring to support what they knew best namely the schools sector. The discretionary powers allowed the local authorities and local education authorities to exercise widely differing approaches to FE colleges and this was to cause major problems when colleges gained independence from the authorities following incorporation in 1992. As a result of the varying degrees of discretion exercised by the authorities the FE sector had become a very heterogeneous and diverse system in terms of size, quality and most certainly in regard to their commitment to technical education. For example the wide variation in the funding levels for colleges caused major problems following the incorporation of colleges in the early 1990s. The government and the newly created Further Education Funding Council (FEFC) underestimated the scale of the problem and introduced very simplistic approaches to reduce the inequalities. One particularly crude funding regime introduced was called the convergence method. Instead of analysing the true costs of provision especially those associated with technical/practical/workshop activities they adopted the lowest common denominator approach that brought about the closure or reduction in key

subject areas e.g. plumbing, construction, engineering, physical sciences. This destructive approach has contributed to the current shortages in provision in these and other strategically important technical/vocational subjects in colleges.

The 1980s

The 1980s witnessed the development of an array of initiatives most of which failed to rectify the continuing problems and concerns about declining productivity, skills shortages at all levels in manufacturing, the public services and in key subjects such as science and mathematics. Research by now had shown a direct correlation between productivity and skill levels e.g. moving 1 % of the workforce from unskilled to skilled level would bring about 2% increase in productivity. International league tables continued to show that the country was failing to keep pace with technological and economic change and its inability to stem its decline in international competitiveness. For example the National Economic Development Office publication 'Competence and Competition' again demonstrated this country's economic decline in comparison with our trading competitors.

It was clear by the 1980s that fundamental mismatches existed between the providers of specialised technical education and training, the labour market and vocational qualifications. As a result of the absence of a national strategy for technical education and training, no identifiable mechanisms existed to manage and coordinate effectively all the disparate elements in the system which still lacked unity and coherence. As a result of ad hoc growth a multitude of separate organisations had acquired varying degrees of responsibility in such aspects as funding, student support, examinations and assessment and inspection. This inevitably created massive inertia in the system especially when reforms were being advocated. Many of the organisations associated with technical education were very parochial and proud of their history and this often led to reluctance to embrace fundamental changes, which could have threatened their own integrity. Successive reforms in key areas of technical education had often floundered because of the resistance of organisational interests e.g. development of NVQs, GNVQs and A level reform. You only have to look at the number of professional bodies that oversee such disciplines as engineering, mathematics to see the absurd situation that still exists and how this continues to impede

essential reforms that are urgently required. It is important to note that many of these organisations still have responsibility in accrediting and approving technical qualifications.

The following list illustrates how confusing and complicated the examinations landscape for technical subjects had become by the 1980s:

- Vocational bodies such as CGLI, BTEC, RSA, LCCI, Open College et al
- Six regional examining bodies (REBs)
- Approximately 250 professional bodies including 76 with royal charters and other non-chartered bodies which together represented such disciplines as chemistry, engineering, construction and management.
- A number of standard setting bodies such as the joint industry councils, non-statutory industry training organisations e.g. Chemical Industries' Association
- 120 industry training organisations of which 8 were Industry Training Boards with statutory responsibilities. Many possessed mechanisms to train and assess and some had developed joint certification in such areas as engineering, and agriculture.

In spite of this bewildering array of organisations other fundamental weaknesses existed namely:

- Lack of a clear and comprehensible framework for vocational and technical qualifications
- Considerable overlaps and duplication of qualifications across the awarding bodies
- Major gaps in provision particularly in the newer technologies
- Ill-defined protocols for progression, transition and transfer both for students and subjects
- Continued inflexible arrangements in colleges and examination boards creating barriers for entry and attendance
- Little understanding of how to assess in the work place
- Assessment skewed towards testing knowledge rather than skills and competence in real working environments
- Lack of systems to assess prior learning and experience especially in the work place

The National Council for Vocational Qualifications (NCVQ) and National Vocational Qualifications (NVQs)

The first attempt to review and reform vocational qualifications was undertaken in 1986 with the creation of the NCVQ and the development of NVQs. The NCVQ was charged with creating a comprehensive framework for vocational qualifications to meet the needs of the employment sector and individual candidates. The qualification system was to be based on occupational standards or competences that were to be defined by industry/employer-led bodies. The competence-based qualifications also required both practical and intellectual skills with the relevant underpinning knowledge needed in the workplace. Another advantage was that the assessments were to be located in the work place and not through college based simulation. The progress and general reception of this important and worthy reform has been mixed since its introduction. New occupational qualifications were introduced where gaps had previously existed but it did not act as a catalyst to bring about a unified framework for all qualifications offered post-16. A number of misinformed academics questioned the value and validity of NVQs and these concerns were given high profile coverage in the media. Many FE staff also were resistant to their introduction and coupled with a growing bureaucracy and high cost associated with their delivery the awards always seemed to attract criticism. Sadly many FE staff were often reluctant to change their teaching techniques and approaches being more comfortable with the status quo. This negative attitude sadly has undermined the real benefits of NVQs that did recognise the true value of work-based assessment and attempts to involve employers. In spite of some flaws in the methodology they did not deserve this level of criticism. By 2002 nearly 3.75 million certificates had been awarded and a number of key groups had fully exploited their value e.g. the Royal Engineers. As always traditional qualifications i.e. 'A' levels still remained dominant with employers, parents and students. In addition because of funding issues colleges found it difficult to create real working environments (RWEs) that were essential to deliver NVQs. CGLI, BTEC and other examining bodies designed, provided and managed competence-based programmes that offered an additional curriculum route for

students wishing to pursue a more vocationally biased programme. Another reason why the traditional route remained popular was the collapse of the manufacturing base during the '70/80s/90s and the rapid disappearance of apprenticeships. The loss of day/evening released students to local colleges to study craft and technician programmes created major problems for local authorities and colleges who replaced this lost provision with the traditional GCE subjects. Academic drift continued and increasingly colleges recruited more and more students on non-technical programmes. Many technical departments in colleges began to close, downsized or were merged with other departments in order to deal with the significant reductions in student numbers.

The new vocationalism that dominated the 1970s and 80s largely driven by youth unemployment did little to address the fundamental weaknesses in technical education and training. The majority of initiatives were based on political expediency and short termism. In retrospect many MSC programmes are now seen as being too narrow and simplistic as technical education involves more than just training for job specific skills but requires other wider skills and competencies. Another key factor was the continuing transitions in the profiles of employment i.e. from manufacturing to low-quality service work requiring low skill levels. These jobs were predominately part-time and as a result were seen by employers as not requiring any meaningful training. As manufacturing declined many politicians questioned whether the country actually needed more technically qualified people arguing that the country was a service-based economy. This perception has continued to this day especially as the global economy increases and the country positively encourages the out-sourcing of manufacturing and overseas companies to acquire or merge with our remaining manufacturing companies. As the manufacturing base declined it also became more diverse involving products and services associated with entertainment, design, personal and financial services. Although this transition was possibly inevitable in the first industrialised nation the pendulum swung too far to a service based economy for the essential balance between manufacturing and service to be maintained.

Student Numbers in the 1980s.

Table 1 shows the destination rates during the 1980s and the impact of the MSC programmes. The table illustrates the percentage of the 16, 17 and 18 year-olds in 1981/2 and 1989/90.

One of the recurring themes in this history is the ability of this country to keep commissioning endless reviews and reports about the inadequacies in technical education. The published material invariably ended up on the shelf to gather dust and as a result has little or no impact. These reports carried lots of empty rhetoric and political hype about Britain developing world class skills and competing favourably in the emerging global economies but it was just talk. This country is world class in holding meetings and writing reports but little else merits the now over-

Table 1 – Destination of 16, 17 and 18 year-olds in 1981/82 and 1989/90

	16 year-olds		17 year-olds		18 year-olds	
	1981/82	1989/90	1981/82	1989/90	1981/82	1989/90
Schools	31	34	19	23	2	3
FE	14	20	11	15	5.5	8
HE	0	0	0	0	8.5	10
YTS/YT	9	21	5	21	2	2
Employment	28	18	49	33	66	69
Unemployment	12	7	16	8	16	8

Sources: DFE Statistical Bulletins/DFEE

used accolade. To complete this chapter on the 1980s and to illustrate this culture of review and reporting the following list shows some of the relevant initiatives and reports:

Some important dates and events

- 1982 Cockcroft Report –major report on mathematics
- 1982 TVEI launched with pilots started in 1983
- 1983 CPVE introduced
- 1983 One year YTS introduced
- 1983 BEC and TEC merged into Business and Technical Education Council (BTEC)
- Better Schools published– policies to improve the preparation of young people for work
- 1985/6 Review of Vocational Qualifications
- 1987 City Technology Colleges Trust established – First CTC opened in Solihull in 1988
- 1986 YTS extended to two years
- 1987 Open College, (formally the Open Tech) created to provide open access to training and reskilling
- 1988 Higginson Report
- 1988 MSC renamed the Training Commission (TC)
- 1989 TC abolished

Some other relevant Parliamentary Acts, Reports, Committees and Commissions

- ‘A New Training Initiative: A Programme for Action’ (1980) which set an agenda for the decade. Three national objectives were articulated:
 - a) Resources for a new Youth Training Scheme
 - b) Creation of the Open Tech Programme – later to become the Open College
 - c) A target date for the completion of the modernisation and development of apprenticeships and other long-term training programmes and the development of more vocationally relevant provision in full-time education (TVEI), closer links between education, training services and industry in localities
- ‘Employment and Training Act’ – abolished the ESA and TSA (1981)
- ‘Employment and Training Act’ – removed trade unions from decisions about costs of training on employers and set up regulatory framework for ITBs (1982)
- ‘Training for Jobs’ Government announced its Adult Training Strategy and new arrangements concerning vocational education in FE (1984)

- 'Employment – the Challenge to the Nation!' Emphasised that the quality of the labour market needed to be improved and made more flexible in order to respond more effectively to the rapidly changing business climate.(1985)
- 'The Development of HE into the 1990s' Government thinking on the need for HE to contribute more effectively to improve the country's economic performance. (1985)
- 'Further Education Act' Gave colleges and polytechnics the right to sell goods and services from their activities (1985)
- 'Education and Training for Young People' – major expansion of YTS. Highlighted the ridiculous number of vocational qualifications (1985)
- 'Working Together – Education and Training' announced the extension nationally of the TVEI pilots, establishment of the National Council for Vocational Qualifications (NCVQ). (1986)
- 'Employment Act' – introduced bridging allowance for young people waiting to take up YTS place (1988)
- 'Education Reform Act (ERA)' Included a wide range of reforms including: The introduction of the national curriculum and assessment. Universities Funding Council (UFC) replaced by the University Grants Committee (UGC) and polytechnics and large colleges of HE removed from LEA control. (1988)
- 'Training for Employment' proposed new Employment Training Scheme (ET) aimed at the unemployed (1988)
- 'Employment for the 1990s'-proposed the creation of the TECs and LECs (1988)
- 'FE – A New Strategy' –proposed major reform to FE and supposedly put the sector centre stage (1989)
- 'Employment in the Nineties' Recommended that a taskforce be established to set up the Technical Education Councils (TECs) and the remaining ITBs be phased out.

Chapter 11

The 1990s

In spite of all the government initiatives and the activities of the MSC and its successors during the 1980s technical education and training continued to be seen as second class. It was still a political pawn, subject to the latest whim of a succession of governments that showed little understanding of its strategic importance to the country.

What was still lacking was a comprehensive and detailed analysis of the purpose of the technical education and training system and its relationship to the country's economic performance. This was in many ways the most critical factor that held back the development of a unified and coherent national system. This aspect will be considered in more depth in the last chapter.

As a result of the expansion of student numbers in HE the country began to see increasing graduate unemployment as well as graduate under employment. As a result of the expansion in graduate numbers during the 1990s one could translate the 1980s headline 'training without work' into 'education without work'. It seems as if universities, in order to attract more students, were developing degrees that were not fit for purpose with little regard to the needs of the economy. Degree programmes proliferated in such areas as media studies, golf studies and even one in beach management studies! The government announcement of a 50% participation in HE by the under 30 year olds will increase this unfortunate trend. The development of foundation degree programmes might increase the participation rate for vocational and technical subjects. However the first few cohorts of foundation degree titles reflected very few programmes in engineering and the physical sciences. This unfortunate development reflects the inadequacy by government and its departments of managing the demand-supply equation and labour market intelligence.

Training and Enterprise Councils (TECs)

Just as the NCVQ was created to reform national vocational and technical qualifications, the 1990s witnessed an attempt to reform skills training by creating the (TECs) in England and Wales (82) and 22 Local Enterprise Councils (LECs) in Scotland. In addition to identifying local training and skills needs the Councils were tasked with enterprise development. They had a very wide remit covering such areas as modern apprenticeships, adult retraining and extensive training programmes for unemployed young people. The Councils contracted the work to colleges and private training providers. In addition the TECs became responsible for other aspects of work-based learning including the management of Youth Training (YT) that had replaced YTS.

The Further Education Funding Council (FEFC)

Up to 1993 the further education colleges were maintained by Local Education Authorities and as such had no independent legal existence or status. Legally they were indistinguishable from the Local Education Authority. Staff were employees of the Local Authority and the estates and funds they used belonged to the Authority. The college and its governing body acted in all aspects on behalf of the Authority but this was to change following the Further and Higher Education Act of 1992. The first stage was enshrined in the 88/89 legislation that had given colleges considerable independence but still left them within local authority orbit.

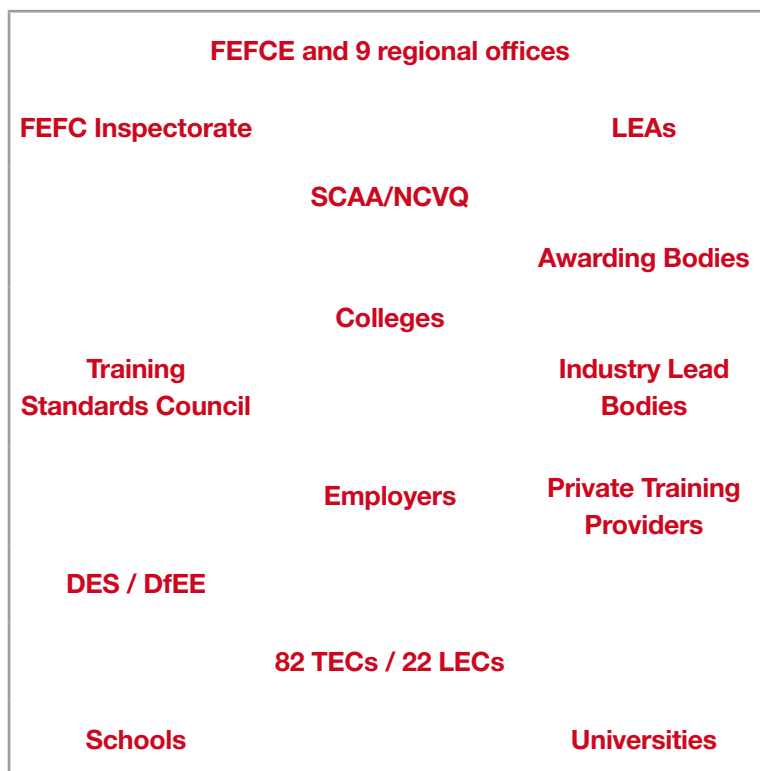
The FE sector was fundamentally reformed as a result of the Further and Higher Education Act 1992. In all 465 colleges including sixth-form colleges were incorporated in 1993, removing them from Local Authority control. The LEA's role was then replaced by the Further Education Funding Councils for England

and Wales. This model of a national funding council mirrored the arrangements for the English Polytechnics and Colleges of Higher Education when they were removed from the Local Education Authorities in 1989.

Prior to incorporation in 1993 colleges under the control of the LEAs had been influenced, directed and shaped by a particular LEA's strategic planning for post-compulsory education/training. The LEA largely formulated the nature of an institution and its relationship with the local community and especially with schools. As a result of this a wide set of approaches was adopted by LEAs - many colleges were given, particularly following the 1989 Education Act, relatively high degrees of freedom to develop their own purpose and mission whilst others were highly controlled and constrained. Some LEAs were supportive of their colleges whilst others treated them with a fair degree of indifference and even neglect. As a result the resources, estates and in particular funding showed significant variations across the FE sector and its constituent colleges. Some LEAs proscribed certain areas of provision for college's e.g. adult education and GCE 'A' level programmes. This variation of management and treatment created a wide range of institutions across the sector and this coupled with the way colleges had developed historically established a very diverse and heterogeneous sector in terms of its student populations, provision and size.

At incorporation FE colleges and Sixth Form Colleges were brought together to form a new FE sector that was funded by the FEFC, the nationally created quango supported by nine regional offices. The FEFC allocated monies to the colleges as well as operating an inspection division. It was established on 17th July 1992 and the Secretary of State for Education set the following statutory duties on the Council:

- to secure the provision of sufficient facilities for full-time education suitable to the requirements of 16-18 year olds. (This provision had to take into account education for that age group provided by LEA maintained schools, grant-maintained schools, non-maintained schools and City Technology Colleges)
- to secure the provision of adequate facilities for part-time education suitable to the requirements of persons over compulsory school age, and full-time education suitable to the requirements of those aged 19 and over



New Post-16 landscape under FEFC and TECs

The inclusion of sixth-form colleges in the new FE sector brought together institutions with very different traditions and missions. One of the main failures following incorporation was the lack of recognition and awareness by central government and the FEFC of the massive variations across the institutions comprising the new sector e.g. large mixed economy colleges of FE/HE, general colleges of FE, sixth-form colleges, tertiary colleges and the monotechnics (specialist institutions e.g. agriculture etc). Many of the problems created by incorporation emanated from this initial and fundamental error in establishing the new sector. The wide variation in institutional mission, curriculum mix e.g. academic/vocational/adult, estates profile and staffing profiles was never fully recognised or managed during this initial and critical period at incorporation. It was the inability to recognise this diversity, heterogeneity and complexity that has caused many of the problems since 1993 particularly for technical education and training.

The Government and the Funding Council adopted an accountancy mentality to the sector wanting a more homogeneous sector and perceived this diversity and complexity as a sign of weakness. They

inevitably compared the sector and its constituent colleges with the school and university sectors which were much more unified and homogeneous particularly in terms of their student populations and range of awards. One of the reasons for incorporating colleges was to reduce local authority expenditure and ameliorate some of the difficulties associated with the poll tax. The real rationale for creating the new FE sector was based on political and financial grounds as opposed to educational ones. The funding methodology was never really understood by the providers let alone the architects of the system. It was predicated on growth and was frequently referred to rather trashily as the 'dash for cash' or 'bums on seats.' The really damaging effect of the funding was on the lower recruiting, high cost provision in such critical areas as science, engineering, construction crafts and technician studies. The senior staff of FEFC visited colleges and advised principals to close or curtail provision in these areas. Many principals agreed and then replaced these technically orientated subjects with high recruiting low cost, non-technical programmes. As a result many technical departments providing craft and technician training were closed, merged with other departments or provision was significantly reduced. As a result the capability and capacity for colleges to deliver these important subjects was significantly reduced or in many cases lost forever. This lack of capacity was to be highlighted with all the recent debates about the shortages of technicians and craftspeople e.g. plumbers, electricians.

The reduction of technical provision in FE was beginning to be mirrored in the university sector as they too began to close or merge departments offering such subjects as the physical sciences, mathematics, engineering and construction.

In spite of these negatives a number of advantages did result from incorporation because of colleges' greater independence which in theory did provide them with new opportunities to exploit and capitalise on their past achievements. Colleges could formulate, implement and direct their strategic plans and more precisely locate themselves in the post compulsory school landscape for education and training. Additional degrees of freedom were given to colleges in order to respond more effectively and efficiently to such factors as the changing needs and demands from employers and society in general and to various government initiatives. All these factors and others had to be accommodated within the rapidly evol-

ving framework of rigid control and accountability developed by the DfEE and FEFC and other sponsors particularly the Training and Enterprise Councils (TECs). Overall the colleges accepted the creation of a quasi-national system funded centrally by the FEFC and the requirement to improve efficiency. This latter point was important bearing in mind that the funding allocated by the FEFC came from public monies.

Incorporation had brought about a significant growth in student numbers but not in the technical and vocational programmes. In spite of increasingly centrally driven funding and inspection regimes the FE sector still lacked a coherent and unified national system. The technical and vocational provision was still characterised by insensitive funding mechanisms and created a multitude of often competing organisations and agencies that attempted to influence provision. During this period competition was encouraged by the FEFC and the TECs between the various players i.e. colleges, schools and training providers and again this damaged the technical subjects. This quasi type of independence caused many difficulties including widespread use of low quality franchising, appointing poorly qualified and experienced part time staff from private agencies and malpractice in counting student numbers in order to maximise revenue.

The FEFC created all sorts of lasting problems for the FE sector particularly associated with funding and when it was replaced by the Learning and Skills Council one hoped the situation would improve. However in many ways the constraints and controls increased.

Industry lead bodies - an update

Full employment in the 1960s and early 1970s meant that industrial training was the responsibility of the 25 or so ITBs that were based on industrial sectors. Later on in the 1970s and early 1980s growing high unemployment, particularly youth unemployment, raised questions about the effectiveness of ITBs and this contributed to the MSC becoming the major player in national training programmes. The majority of the ITBs were abolished and replaced by Industrial Training Organisations (ITOs) which were more industry specific. In addition there were a number of Lead Bodies (LBs) and Occupational Standards Councils and like ITOs all under-funded and as unemployment fell in the late 1980s and throughout the 1990s their effectiveness was questioned. This

brought about yet another reform in 1995. The 180 ITOs, LBs and OSCs were brought together to create National Training Organisations (NTOs) and the reformed National Council of Industrial Training Organisations was replaced by the NTO Council.

National Training Organisations (NTOs) were established in 1997 and 65 NTOs had been recognised by 1997. NTOs existed, like their predecessors, to provide strategic leadership and advice on education and training for their employment sector. Other responsibilities included addressing skills needs and shortages, promoting vocational technical qualifications. However NTOs did not readily gain the confidence, support and recognition of the employers and before they even began to have any influence were wound up and replaced by the latest employer network namely the Skill Sector Councils (SSCs) in 2002.

Initiatives

The DfEE 1998 publication 'Learning Age – a renaissance for a new Britain' proposed two interrelated

policy frameworks for adult technical training: the University for Industry (Ufi) and Individual Learning Accounts (ILAs). Both of these hastily introduced initiatives failed to achieve their ambitious objectives. Ufi was a misnomer because it was not a university and could never achieve that status and most certainly, as it turned out, had little to do with industry. It currently offers a range of relatively low level programmes (at level 2) in IT and key skills. ILAs were eventually wound up after accusations of fraud and malpractice. However the Labour government is wedded to the concept of ILAs and has now proposed in the 2006 White Paper FE Reform: Raising Skills. Improving Life Chance a variation called Individual Learning Grants (ILGs)! These are but two examples of New Labour's plethora of policy statements and initiatives that have created little improvement in any aspect of education and most certainly in technical education and training. The list below illustrates a number of the relevant initiatives during the 1990s:

Some relevant Parliamentary Acts, Committees and Reports

- 'British Baccalaureate' IPPR published in 1990 – in spite of authors being Labour supporters never implemented even after the party came to power in 1997
- 'Higher Education' – recommended expansion of HE student numbers 1991
- 'FE and HE Act' – polytechnics designated universities, CNNA abolished, FE colleges and sixth form colleges removed from LEA control and the Further Education Funding Council (FEFC) and the Higher Education Funding Councils (HEFC) established (1992)
- 'Competitiveness : Forging Ahead' DTI -attempted to forge stronger links between education and employment 1995
- 'Education Act' – Qualifications and Curriculum Authority established merging the NCVQ and SCAA 1997
- 'The Learning Age - a renaissance for a new Britain' – one of the many glossy publications from new Labour this one was about lifelong learning. (1998)
- 'Improving Literacy and Numeracy' Moser Report 1999

- 1990 Training credits piloted.YTS renamed Youth Training (YT)
- 1991 CPVE replaced by the Diploma of Vocational Education (DVE)
- 1994 Modern Apprenticeships (MAs) piloted and introduced in 1995 also accelerated MAs announced – aimed at NVQ level 2
- 1995 Youth Credits introduced Youth Training name dropped
- 1995 Department for Education and Employment (DfEE) created following merger of Employment Department and Department for Education
- 1996- Dearing Report – review of 16 to 19 vocational qualifications -GNVQs introduced
- 1996 Review of 100 NVQs and SVQs
- 1997 Dearing Review of HE
- 1997 National Traineeships introduced replacing YT – aimed at NVQ level 2
- 1997 New Deal launched – a number of programmes for young and older people – aimed at increasing sustainable employment
- 1997 QCA replaced SCAA and NCVQ
- 1998 University for Industry prospectus published
- 1999 Modern Apprenticeships expanded to 82,000 places. Investors in Young People renamed Connexions
- 1999 Education Maintenance Allowances (EMAs) piloted to increase post-16 take-up

Chapter 12

2000 to the present

The Early 2000s and Conclusions

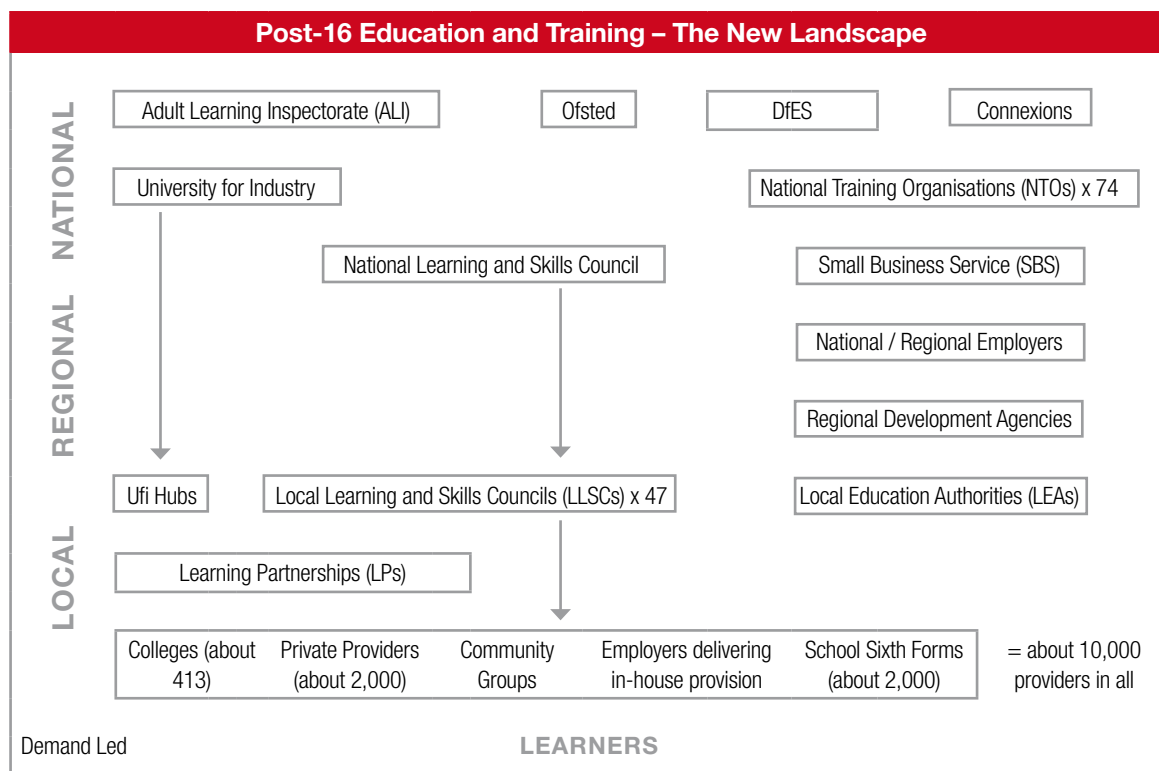
Following the 'Learning and Skills Act' in 2001, the FEFC and TECs were replaced by the Learning and Skills Council (LSC) which assumed responsibility for the planning and funding of FE and government funded training. The LSC worked through a regional network of 47 Local Learning and Skills Councils (LLSCs). It had an annual budget of £6 billion and a very wide remit which included the following elements relevant to technical education:

- Assess learning and skills needs and to implement the Skills Task Force proposals
- Coordinate planning and funding for: FE colleges, 6th forms, work-based training, workforce development, education-business partnerships and careers advice and guidance for adults
- Education -Business links

The post-16 landscape

The LSC replaced the FEFC, the LLSCs replaced the TECs, the Small Business Service and local franchises replaced the Business Links and a new inspection regime was created replacing the Training Standards Council and the Training Inspectorate. As a result an extended FE sector was established that comprised over 400 FE colleges, approximately 2,000 training providers, 2,000 school sixth-forms and a number of voluntary/community groups/institutions.

So yet another set of organisations were established to tackle the problems confronting the post-16 sector including technical education and training. The FEFC period had left the FE sector and its constituent institutions weakened by the operation of a very divisive funding regime that was based solely on the popularity of certain courses and offered little protection to low recruiting, high cost craft, technician and technologist programmes.



HE is excluded from this landscape

Although overall student numbers have grown significantly in FE and HE during the past fifteen years enrolments in engineering, the physical sciences, mathematics have continued to decline. Equally worrying is the decline in enrolments in craft and technician programmes creating the well publicised shortages of well trained and qualified plumbers, bricklayers and other craftspeople. As a result many technical subject departments in colleges and training providers closed or were downsized in such key areas as engineering, construction crafts etc. The FEFC created a bureaucratic model of incorporation and exercised significant control through its over complicated funding methodology.

When the LSC movement was established many TEC staff were appointed partly to minimise redundancy costs and as a result the Councils were overstaffed and employed people who lacked the appropriate experience to rise to the challenging LSC agenda. The first few years witnessed a relatively large turnover of senior staff with all the resulting uncertainties that created. In 2005 a major review was undertaken that brought about a significant reduction in staffing and the rationalisation in the number of LLSCs. So yet again the key organisation responsible for developing a stable technical education and training system was subjected to major reform and resultant disruption. Time will only tell if these reforms will create a stable and secure set of structures that will tackle the long standing problems confronting the country in regard to skills, productivity and international competitiveness.

Latest developments with Industry Lead Bodies

The 73 National Training Organisations (NTOs) were developed at a slow pace and were mandated to set standards and encourage employers to train in their sectors. The government decided in 2000 that there were too many NTOs and in 2001 replaced them with fewer Sector Skills Councils (SSCs) numbering around 25. The SSCs have been required to:

- Reduce skills gaps and shortages
- Improve productivity
- Increase opportunities to promote skills and productivity across the workforce
- Improve learning supply that involves HE (whatever that means?), apprenticeship programmes and occupational standards

The formation of the SSCs also took a relatively long time and caused a great deal of concern and confusion with employers and providers. Many commentators felt it reflected the government’s lack of understanding of their purpose and general ignorance of technical education.

Because of the current industrial climate and the challenges from the global market it is essential to have a strong sectoral training structure that can address such issues as how to increase productivity and national competitiveness. But already fundamental concerns are being expressed about the long-term effectiveness of SSCs. Government funding is not generous and is time limited and ultimately it is expected that employers will pick up the tab – history would indicate this is a false and dangerous assumption. Also questions are already being asked about the competence and ability of the staff employed in the SSCs and how the Councils will relate to the Regional Development Agencies (RDAs). Time will only tell if SSCs will realise their objectives but their long birth and limited impact to date coupled with history of lead bodies does not bode well.

Qualifications

The Review of Vocational Qualifications in 1986 led to the creation of the NCVQ and NVQs that were based on occupational standards owned by industry and set by a succession of industrial lead bodies such as ILBs later called Lead Bodies (LBs), NTOs and currently SSCs. Eventually the NCVQ was merged with its equivalent for school qualifications namely Schools Curriculum and Assessment Authority (SCAA) to create the Qualifications and Curriculum Authority (QCA). Sadly SCAA personnel dominated QCA and as a result technical and vocational qualifications became the responsibility of an organisation that had little commitment let alone expertise to advance the achievements of the NCVQ. The Review of Vocational Qualifications failed to rationalise the number of qualifications, many of them in technical areas. This failure can be highlighted by analysing the FEFC qualifications database of 1998 that showed 14,413 different qualifications being delivered by some 600 awarding bodies. The following list shows the details:

GCSE	1,598
GCE A and AS	1,752
Access to HE	1,155
NVQ	1,811
GNVQ	216
OTHERS	7,881

As mentioned in earlier parts of this history vested interests of professional and other award bearing bodies resisted earlier attempts to rationalise the qualifications system. Although, to be fair, in some cases there was evidence that these 'other qualifications' did satisfy the needs of employers. Unfortunately the increasing intervention and interference by successive governments into the qualification system has not brought about the rationalisation that is urgently required. Instead government meddling has brought about a large number of changes including the creation of yet more regulatory bodies and produced even more confusion and complexity to the qualifications landscape. The latest attempt is the Framework for Achievement (FfA) that is already attracting a great deal of criticism especially in regard to the proposals associated with the technical and vocational qualifications.

A Key Factor

As this history has highlighted a major problem that continually blights the technical education and training system is its fragmented nature and the absence of a clear national purpose. There is now an urgent need to identify and define the key factors and how they interrelate and interact with each another to drive and manage the system in a sustained way and be effective, efficient and economic. It's the absence of this analysis and the complex balances between them that has contributed to many of the problems in technical education and training. To date each recent government emphasised one selected factor over others and this created a system that was out of balance. Some of the critical factors are:

- Funding – who pays – learners, government, employers - and at what proportion?
- The roles of private vs. public sector providers in technical education and training
- What kind of market should operate – totally free or partially controlled in order to protect subjects of strategic importance to the country
- Degrees of freedom and choice that should be available to the student in the curriculum?
- Supply and demand issues

Each of these factors requires a detailed, holistic and careful analysis. For example, unpacking the demand - supply factor is critical when considering skills shortages and the effectiveness of labour market intelligence and technical education. This factor is a

complex mix of interactions that includes: employer demand vs. provider supply; student aspirations vs. employer demand; and provider supply vs. student aspirations. The effective management of these often-competing elements is essential in order to begin to resolve many of the current problems associated with labour market intelligence and identifying skills gaps and shortages.

Concluding Remarks

The research and writing of this short and at times personal history has been enjoyable providing a rich and fascinating insight into this important aspect of the education system. Constraints of time and space have made it impossible to record all aspects in this complex topic and as a result many key elements have not been considered. The introduction provided an overview of the subject and in conclusion it might be useful to return to some of the issues raised at the beginning of the series. This history of technical education has most certainly confirmed and reinforced the laissez faire philosophy that prevailed for most of the period since the late 18th century. Even when governments did begin to introduce centralist control it failed to develop robust, consistent and sustained policies. Whichever government was in power, inevitably schools and universities seemed to receive more resources and attention. This sad factor reinforces the low esteem towards vocational and vocational qualifications and highlights the academic – vocational divide. Perhaps this history can be accused of being too negative about the development of technical education and training even after all the reforms and billions spent on the system. But it would seem that in spite of all the initiatives and extra resources little has improved, as many fundamental weaknesses still need to be tackled and resolved as the following list attempts to illustrate:

- Continued interference and intervention from government – split responsibilities across a number of departments – no consistent and coherent policy approach
- Ineffective labour market research and intelligence systems
- Still a very fragmented sector – too many organisations involved and this is increasing under this administration e.g. academies, skills academies, specialised schools etc.
- The damaging consequences of the operation of the free market resulting in wasteful competition

- What levels of freedom and autonomy should providers be allowed to exercise
- Enrolments on technical subjects continue to decline at all levels
- Mathematics, statistics, engineering and the physical sciences subjects continue to be unpopular
- The completion rate for apprenticeship is woefully low at 39%
- Very few technical/vocational Foundation Degree programmes
- Ageing staff profile in FE - the majority of whom lack recent experience of the vocational sector and/or the work place.
- Shortages of qualified staff in FE
- Not clear how the proposed National Skills Academies will relate to the Centres of Excellence in FE (COVEs)
- Skills gaps and shortages continue across practically all industry sectors
- No real sense of urgency to solve the problems e.g., time lines being set for 2020!
- Industrial productivity continues to fall relative to our competitors – current level back to what it was in 1990 (OECD and ONS figures for 2005)
- Continued closures or mergers of university departments in the sciences, mathematics and technology related disciplines – approaching 100 over the past fifteen years
- Poor performance in producing graduates in science, mathematics, statistics and engineering compared with the India, China and Eastern Europe
- The current obsession with level 2 qualifications – little emphasis on the higher levels
- The current absence of any education and training policy for the over 25 year-olds
- Still a lack of understanding by the general public about the role of education and training

Since 1991 successive governments have developed and driven post-16 education and training policy through the FE sector and by definition this has impacted on technical education and training. However these policies have had little impact in developing technical and vocational provision in sixth-forms in schools and sixth-form colleges. A number of strands can be identified during this period namely:

- Participation has been widened and increased particularly for the 16 to 21 age group but this aspect is littered with questionable targets and

performance indices. Relatively small increase in enrolments for technical programmes above level 2

- Imposition of the free market to encourage competition and drive down costs has not necessarily led to the intended improvement in quality
- The introduction of more broader based vocational programmes e.g. GNVQ and Modern Apprenticeships to encourage increased numbers of technically qualified people
- Attempts to encourage a culture of lifelong learning with such programmes as New Deal
- Creating more unaccountable quangos to manage and oversee provision and its delivery e.g. FEFC, TECs, LSC, LLSCs et al

As a result of some of these strands post-16 participation rates have increased. The FE sector enrolled more students than the school and HE sectors combined and colleges recruited more 'A' level students than the school sector. However enrolments for technical subjects declined in relative terms to the general/academic and basic skills numbers. Unfortunately technical and vocational education and training continued to be determined and driven by political ideology and as a consequence moved from one government department to another. Even after the creation of the DfEE – later named the DfES – there was still no single departmental focus or single minister who had overall responsibility for the system. Too often staff lacked understanding or empathy for the subject and other staff in these departments have shown no lasting interest or understanding of technical education and training. You only need to look at the wide variation in the lead times taken to introduce major reforms in technical education. Too often hastily and poorly resourced reforms are introduced e.g. NVQs and GNVQs with little thought for the long-term consequences of these critical developments and how they relate to existing systems. However other reforms can take a long time e.g. the formation of NTOs and SSCs again reflects a lack of real understanding for the implication and importance of the reforms. An equally worrying characteristic in the system is the somewhat unhurried attitude with no real sense of the urgency that is now required to address and resolve the problems. Also the announcement of reducing the additional public expenditure, after the so-called extra funding spree, over the next few years will have a negative impact on post-16 education and training. Also the emerging

culture by government to ring fence funds for special projects and developments ultimately has a damaging effect of other provision and limits providers options in managing their institutions. It is essential that extra funding levels be sustained otherwise expectations are raised in the educational sectors that are then violated!

Manufacturing continues to decline as companies out-source their production overseas and this coupled with the recent flurry of mergers and acquisitions (M&As) of domestic companies by overseas companies means that fewer technically qualified people will be needed. The additional concern following the M&As development is that the Research and Development (R&D) will move to the related overseas country and will inevitably result in a reduction in the domestic training budgets. The increasing growth of mergers and acquisitions could also weaken the national corporate identity of businesses in this country and create a further fragile aspect in its economy as retrenchment always occurs when recessions happen. Clearly the nature of manufacturing has changed over the past few decades and the way the government defines it in terms of statistical returns and reports. Manufacturing in this country according to official statistics has increased by about 30% over the last twenty years but the products and services now include such areas as design, music and financial services. However this increase in relative terms has been less than our competitors and this has resulted in a declining market share in the global economy and a loss of competitive advantage. This country has not managed to achieve a balanced economy and this is currently reflected in a massive and growing trade deficit. The economy is now predominantly a service based one and driven by consumerism and we manufacture and export very little. Any country must

maintain and support a balanced economy comprising services and manufacturing.

However little of these facts and concerns seem to have been considered in any depth by the recent reviews by Leitch on skills and Foster on FE reform. These reviews write about deadlines of 2020 – it might be perfect vision - BUT is ludicrous when you look at the speed at which other competing economies are developing their higher-level technical skills base.

See the table below for a list of some of the initiatives that have appeared since the early 1990s particularly under New Labour that are relevant to technical education – I leave you to assess how successful they have been.

Initiative Overload!

The Labour government when elected proclaimed the mantra ‘education, education, education’ which as it transpired, as many of us thought at the time, was not about Technical Education. The depressing fact is that after such a long and colourful history technical education and training is still not recognised and valued by the government or the country and is still perceived as the Cinderella of the education system. Politicians continue to be largely ignorant of history as evidenced by the culture of not learning from it – technical education and training has suffered greatly from this unfortunate fact. In many ways the Labour government has been the most disappointing and depressing for technical education and training. Lots of talk but little positive improvement, a succession of ineffective Secretaries of State, numerous initiatives with no real purpose and lacking any real coherence or substance.

Academies	International	National Qualification Framework Reforms
Accelerated Apprenticeships	Baccalaureate (proposed to have one	e.g. C2k Quality Improvement Agency (QIA)
Adult Learners Inspectorate (ALI)	centre in each town)	Regional Development
Career Development Fund	Jobcentre Plus	Agencies
Centres of Excellence (COVES)	Learning and Skills Councils	Sector Skills Councils
City Academies	Local Learning and Skills Councils	Skills Task Force
Connexions	Learn Direct (Ufi)	Small Business Service
e-University	Modern Apprenticeships	Small Firms Training Loans
Employment Zones	National Employer Training Programme	Specialised Diplomas
Foundation Degrees	National Skills Academies	Specialist Schools
Foundation Learning Tier	National Traineeships	Time off for Study or Training
Framework for Achievement	New Deal	Training for Work
Functional Mathematics	New Start	Union Learning Fund
Graduate Apprenticeships	National Health Service	Vocational A levels and GCSEs
Individual Learning Accounts	University National Technology Institutes	Work Based Learning for Adults
Individual Learning Grants	National Training Organisations	
International GCSEs		<i>And so more!</i>

Continual reform across all sectors of education and a growing complexity in the landscape of educational providers e.g. academies, national skills academies, specialist schools etc all of which questions the future purpose and nature of FE colleges and training providers. Curriculum reforms which are ill thought out e.g. framework for achievement, specialised diplomas, functional mathematics, vocational GCSEs, international GCSEs, international baccalaureate etc. continues to create confusion and uncertainty in the minds of the public, employers and students.

Final thoughts

Time and space have inevitably limited my coverage of many other important aspects in this short history of technical education. I am now more conscience that there are a number of elements not covered or

I have not been able to do justice to many other topics. The developments and achievements of the home countries have not been covered – this surely would be a fascinating topic to pursue. Other key technical/commercial areas have not been considered such as agriculture, business studies, commerce, design, horticulture and service based industries all of which influenced the development of colleges and other training providers. Also the wider issues associated with the relationship between science, industry and technology and the relationship in historical terms between technical education and science education. The whole area of industrial training and in-house company training has only received limited attention. Perhaps if time allows I will return to these important topics at a date. However accepting these shortcomings I hope the history has proved of value to readers.

Some more important dates and events

- 2000 Foundation Degree Consultation launched – a two-year programme at sub degree level – very few programmes in technical subjects again dominated by non-technical subjects like business, media studies
- 2000 University for Industry became operational – later badged Learndirect
- 2001 Learning and Skills Councils (LSCs) established
- 2001 Connexions – a new youth support service introduced - basically a reconfigured careers service
- 2002 Sector Skills Councils (SSCs) replaced the National Training Organisations (NTOs)
- 2002 City Academies established – private institutions funded by the state - recent inspection reports show that 50% have failed to achieve a satisfactory standard
- 2002 Introduction of the so-called vocational GCSEs
- 2004 University top-up fees
- 2006 National Skills Academies announced

Some relevant Parliamentary Acts, Committees and Reports

- 'Learning and Skills Act' Established Learning and Skills Councils. Created new youth service, Connexions . Reformed the inspection arrangements by extending Ofsted role and created the Adult Learning Inspectorate (ALI) (2000)
- 'Learning to Succeed-Raising Standards in Post-16 Learning DfEE/ES (2000)
- '21st Century Skills – Realising our Potential' (2003)
- 'Future of Higher Education' (2003)
- '14 – 19 Education and Skills' (2005)
- 'Skills: Getting on in business, getting on in work' (2005)
- 'Realising The Potential – A review of the future role of FE colleges' Foster (2005)
- 'Leitch Review of Skills' HM Treasury (2005)
- 'Skills for Productivity' DfES and DTI. (2006)
- 'FE Reform: Raising Skills. Improving Life Chances' (2006) .(This is very much a Treasury driven White Paper even though it is published by the DfES - a sign of things to come?)
- 'Raising Expectations: Staying in education and training after 16' DfES 2007
- 'A Cost-Benefit Analysis of Apprentices and other Vocational Qualifications' S. McIntosh. DfES 2007

Technical Education and Training: A Chronology

Important Education Acts, Command Papers (Cmnd/Cm), Policy Statements, Circulars, Publications and various relevant initiatives related to technical education.

Note from the author:

As this is only the second version of the chronology, errors and omissions may have occurred so I would be grateful for any corrections or additions to the list – thanks. Please send your comments to mail@tmag.co.uk with the subject line “History of Technical Education”. Dick Evans

- 1660** The Royal Society founded
- 1750** Workers and Mutual Improvement Societies founded
- 1754/55** Royal Society of Arts founded
- 1772** Salford Night School for Mechanics founded
- 1789** Soho Night School for Mechanics and Carpenters founded
- 1799** Birkbeck starts lecturing in Glasgow;
Royal Institution founded;
Royal Military College Sandhurst opened
- 1800** Royal Institution founded
- 1816** Robert Owen starts his school at the cotton mills at New Lanark
- 1821** Edinburgh Mechanics Institute founded
- 1823** Glasgow Mechanics Institute founded;
London Mechanics Institute founded;
Birkbeck College founded
- 1825** Society of the Diffusion of Useful Knowledge founded
- 1826** University College founded
- 1828** University College London founded
- 1831** King's College founded

- 1832** Durham University founded
- 1833** Foundation of the British Association for the Advancement of Science founded;
Board of Trade grants to Schools of Design;
First Government grant to education
- 1834** City of London College founded
- 1839** Union of Lancashire and Cheshire Institutes founded;
Committee of Council for Education established;
HMI's created – State Inspectorate established in 1840
- 1840** Battersea Training College opened
- 1842** People's College Sheffield opened
- 1844** YMCA founded
- 1845** Royal College of Chemistry founded
- 1849** College of Preceptors founded;
Bedford College, London founded
- 1851** Great Exhibition;
Government School of Mines opened;
Owens' College Manchester founded
- 1853** Department of Science and Art founded under the Board of Trade. Merged with Board of Education in 1899
- 1854** Birmingham and Midland Institute. (Ultimately became Aston University);
London Working Men's College founded
- 1856** Royal Society of Arts Examinations founded;
Education Department founded
- 1858** London Matriculation Examinations, Oxford Local Examinations and Cambridge Local Examinations introduced
- 1859** Science and Art Department of Board of Trade made grants to classes in technical subjects
- 1860** London University institutes science degrees;
Foundation of Bedford College for Women;
Army Certificates of Education established
- 1861** "State of Popular Education in England" Cmnd 2794 (Newcastle Commission)

- 1864** “Revenues and Management of certain Colleges and Schools”. Cmnd 3288 (Clarendon Commission)
- 1867** Paris Exhibition;
Report from Select Committee on Scientific Instruction (1867-68)
- 1868** “Schools Inquiry” (Taunton Commission);
London Artisans’ Club established; TUC created
- 1870** “Education Act” – established school boards. (Forster);
National Union of Teachers founded;
‘Municipal Universities’ established
- 1871** College of Physical Science founded in Newcastle;
Royal Commission on Scientific Instruction established
- 1872** Report of the Royal Commission on Scientific Instruction. (Devonshire). 1872-75;
University of Aberystwyth founded;
“Education Act” Scotland
- 1873** Trades Guild of Learning established;
Royal Naval College Greenwich founded
- 1874** Artisans’ Institute established;
Yorkshire College of Science founded
- 1875** “Report of the Royal Commission on Scientific Instruction and the Advancement of Science”
Cmnd 1279
- 1878** City and Guilds of London Institute (CGLI) established;
Higher grade schools appear from c 1878
- 1879** Finsbury Technical College established;
City and Guilds Art School established
- 1880** Owens College Manchester becomes a University;
Regent Street Polytechnic opened
- 1881** “Committee on Intermediate and Higher Education in Wales” (Aberdare Report)
- 1882** “Technical Instruction” Cmnd 3981 4 vols. (1882-84) (Samuelson Commission)
- 1883** City Parochial Charities Act. Led to the establishment of such polytechnics as Regent Street, Borough, Battersea, Chelsea, Northern, Northampton and City of London College; University College Cardiff opened

- 1884** Central Institution in Exhibition Road opened;
“Second Report of the Royal Commission on Technical Instruction” Cmnd 3981 (Samuelson)
- 1886** Report of the Royal Commission on the Depression of Trade and Industry
- 1888** Local authorities established
- 1889** Local authorities enabled to supply or aid the supply of technical and manual instruction through a rate of up to a penny in the pound;
Technical Instruction Act – established technical education outside the schools sector
- 1890** Local Taxation (‘Whisky Money’) Act funds for Technical Education became available;
Beginning of “University Day Training Colleges”
- 1895** London School of Economics founded;
“Royal commission on technical education in secondary schools” (Bryce Report)
- 1896** Royal College of Art founded
- 1899** Board of Education founded;
School leaving age raised to 12
- 1900** University of Birmingham created;
Board of Education established;
Royal Charter of Incorporation awarded to CGLI
- 1902** “Education Act” – established system of secondary schools. Abolished School Boards and created Local Education. (Balour);
London University Examination Council founded (1902/5);
Education Act – Local authorities made responsible for technical education
- 1903** Formation of Workers’ Educational Association (WEA);
Victoria University gives place to independent Universities of Manchester, Liverpool and Leeds
- 1904** Regulations for Evening Schools, Technical Institutions and Schools of Art and Art Classes 1904-05 Cd 2172 BoE
- 1906** “Technical Education” (Haldane Commission)
- 1907** Imperial College of Science founded;
Regulations for Secondary Schools, Schools of Art and other Schools and Classes for FE Cd 3555 BoE
- 1908** “Education Act” Scotland
- 1909** Creation of Day Continuation Education proposed for school leavers BoE

- 1911** University Grants Committee established
- 1915** Women's Institutes started;
Department of Scientific and Industrial Research created to sponsor research in universities
- 1916** Secondary Schools Examination Council created
- 1917** "Juvenile Education in Relation to Employment after the War" – proposed compulsory school leaving age of 14- followed by at least 8 hours instruction per week or 320 hours per annum at day continuation classes up to 18. (Lewis Report);
Secondary School Examinations Council established to administer School Certificate and Higher School Certificates examinations
- 1918** "Education Act". Attempted to introduce part-time education, proved ineffective apart from the Rugby area. (Fisher);
School-leaving age raised to 14;
"Examinations in Science and Technology" Circular 1026 (BoE)
- 1919** University Grants Committee (UGC) established;
"Adult Education" Recommended creation of university extra-mural departments. (Smith Report);
Burnham Committee established
- 1920** Army Educational Corps founded. Received Royal Charter in 1946
- 1921** Education Act; School leaving age raised from 12 to 14;
National Certificate Scheme introduced
- 1926** "Education of the Adolescent" Recommended the division of secondary education into the grammar and the secondary modern schools. (Hadow Report);
Closure of Finsbury Technical College
- 1927** Report of Committee on Industry and Trade (Balfour);
Report on an enquiry into the relationship of technical education to other forms of education and to industry and trade. Cmnd 3282
- 1928** "Committee on Education and Industry". (Malcolm Report)
- 1929** Committee on Education and Industry (England and Wales) 2nd report
- 1940** Some responsibilities for training transferred to Ministry of Labour
- 1936** "Education Act" – proposed school leaving age to be raised to 15 in September 1939 – postponed by outbreak of war
- 1938** "Secondary Education with Special Reference to Grammar Schools and Technical High Schools". Proposed the tripartite system of secondary education namely grammar, technical and secondary modern. Proposed school leaving age raised to 16. (Spens Report)

- 1941** “Education after the war. Technical Education – summary of the existing provision for FE”.
ED 126/296
- 1942** National Youth Advisory Council founded
- 1943** “Curriculum and Examinations in Secondary Schools” Supported a tripartite division of secondary education into grammar, technical and modern schools. (Norwood Report);
White Paper on Educational Reconstruction – influenced the 1944 Act Cmnd 6458
- 1944** “Education Act” - made it mandatory for education authorities to provide full-time and part-time further education. (Butler);
Tripartite system created; “To consider the supply, recruitment and training of teachers and youth workers” (McNair Report)
- 1945** “Higher Technological Education”, (Percy Report) which proposed:
- National Colleges;
- Diploma in Technology (or alternatively B.Tech);
- Establishment of a Royal College of Technology;
- Establishment of Regional Advisory and Regional Academic Boards
- 1946** “Scientific Manpower” – proposed ten-year plan to double number of scientists in universities
Cmnd 6824. (Barlow Report);
“Youth’s Opportunity: FE in County Schools” (MoE);
“Education Act” Scotland
- 1947** School leaving age raised to 15; Further Education Ministry of Education
- 1949** Scheme for General Certificate in Education accepted; Report of Special Committee on Education for Commerce (Carr- Saunders)
- 1950** “The Future of Higher Technological Education”. National Advisory Council on Education for Industry and Commerce
- 1951** GCE ‘O’ levels replaced the School Certificate and GCE ‘A’ levels replaced the Higher School Certificate.
- 1952** “FE in Scotland” Advisory Council on Education in Scotland
- 1954** “To examine why some pupils left secondary schools as early as possible, whether more should be encouraged to stay on until 18 and how this could be done. (Gurney-Dixon Report); Associated Examination Board established
- 1955** National Council for Technological Awards established; Diploma in Technology established

- 1956** White Paper “Technical Education” Cmnd 9703 MoE:
 - Stressed need for more scientists, technologists and technicians;
 - Need to link technical education with education in secondary schools;
 - Expansion of building programme with expenditure of £ 70 million; Introduction of sandwich courses;
 - Creation of Colleges of Advanced Technology foreshadowed;
 - Diploma in Technology;
 - Need to expand part-time day release provision;
 - Need for more trained teachers in technical education;
 - “Evening Institutes”. Ministry of Education
- 1957** “Scientific and Engineering Manpower in Great Britain” Ministry of Labour;
 “The Supply and Training of Teachers for Technical Colleges” (Willis Jackson Report);
 “Liberal Education in Technical Colleges” Circular 323 MoE; “Libraries in Technical Colleges” MoE
- 1958** “Training for Skill” (Carr Report)
- 1959** “15 to 18”. The Central Advisory Council for Education. Proposed a 20 year programme to ensure that by 1980 50% of pupils stayed in full-time education until 18. (Crowther Report); “Report on the Wastage of Students on Part-Time Technical and Commercial Subjects”
- 1960** “Secondary school examinations”. Recommended the creation of the Certificate of Secondary Education (CSE). (Beloe Report);
 “Review of the Youth Service” For the 14-20 age group. Proposed the expansion of the Youth Service. (Albemarle Report);
 “The Administration of Grants to Students” (Anderson Report);
 Memorandum on the industrial training of students. National Council for Technological Awards
- 1961** “Better Opportunities in Technical Education” Cmnd 1254 MoE;
 “Technical Education in Wales”. (Davies Report)
- 1962** “General Studies in Technical Colleges” DES; “Industrial Training” Cmnd 1892 – laid foundations for Industrial Training Act of 1964;
 “Forward from School- links between school and FE” DES

Wales

Between 1833 and 1974 the Welsh state education system was administered by the same departments that were responsible for education in England. From 1974 to 1999 education was the responsibility of the Welsh Office. From 1999 state education became the responsibility of the Training and Education Department of the National Assembly.

- 1963** “Review of Higher Education” Cmnd 2154 (Robbins Report):
- Detailed survey of the need for higher education; Predicted that by 1980/81 approximately 560,000 places should be provided in higher education;
 - Syllabuses of first degree courses should be regularly reviewed and a higher proportion of students should receive a broader education for their first degrees;
 - Training colleges should be re-named College of Education, with opportunities for students to prepare for the degree of B.Ed in some cases;
 - A need for higher proportion of courses in technology; Five special institutions for scientific and technological education and research (SISTERS) to be established;
 - Ten Colleges of Advanced Technology to be created;
 - Regional Colleges to develop a wider range of full-time courses – ten of these to be established together with Colleges of Education to Universities;
 - A Council for National Academic Awards to replace the National Council for Technological Awards and to award degrees in a range of subjects;
 - Six new universities (additional to those at present in formation) to be established immediately;
 - Need for more staff;
 - Residential accommodation should be provided for two-thirds of students in higher education;
 - Important recommendation in connection with internal Government of Universities and Colleges under local authorities;
 - Recommended that there should be a Minister of Arts and Science responsible for the Grants Commission, the Research Councils and the Universities and a Minister of Education responsible for the other institutions of Higher Education. Was not accepted. A single Department of Education and Science established which co-ordinated these activities;
- “Half our Futures” – To consider the education of pupils of 13 to 16 of less than average ability, education being understood to include extra-curricular activities Cmnd 1892 (Newsom);
- “From School to FE in Scotland” (Brunton Report)
- 1964** “Day Release for Young People Under 18” (Henniker-Heaton Report);
- “Industrial Training Act”. Established a number of Industrial Training Boards (ITBs);
- “Committee Report on Technical College Resources”. National Advisory Council on Education for Industry and Commerce; Schools Council for Curricula and Examinations established;
- DES replaced the Ministry of Education;
- Council for National Academic Awards (CNAA) established;
- “The Public Relation of FE” (Alexander Report) National Advisory Council on Education for Industry and Commerce
- 1965** Certificate of Secondary Education (CSE) instituted; Training Colleges renamed Colleges of Education;
- Crosland’s speech at Woolwich on polytechnics; Comprehensive schools established
- 1966** “Government of Colleges of Education” which led to Circular 7/70 and the democratisation of FE College Governance. (Weaver Report);
- “A Plan for Polytechnics and Other Colleges. HE in the FE System” Cmnd 3006 DES;
- “University of the Air” Cmnd 2922 DES

- 1967** Proposal to establish Open University. Created in 1969.
- 1968** “Flow of students into science and technology” (Dainton Report) DES;
“Government of Colleges of Education and other Colleges of FE” Wales
- 1969** “Report of the Committee on Technician Courses and Examinations”. (Haslegrave). Established two new bodies – Technician Education Council (TEC) and Business Education Council (BEC) – to be in charge of planning, coordinating and administering technical courses and examinations. TEC set up in 1973 and BEC in 1974. DES Scotland had two equivalent Councils SCOTEC and SCOTBEC;
Open University receives its royal charter;
“The Training of Technician Engineers” (Collop Report)
- 1970** Report of an Inquiry into the Pattern and Organisation of the College Year DES;
“Vocational Courses in Art and Design” DES
- 1971** “The Structure of Art and Design Education in the FE Sector” DES
- 1972** “Teacher Education and Training” Cmnd 6869. (James Report);
“Education: A Framework for Expansion” Cmnd 5174 DES;
“Training for the Future” Department of Employment;
School-leaving age raised to 16;
OND Technology launched; “Development of HE in the Non-University Sector” Circular 7173
- 1973** “Review of non-vocational adult education in England and Wales. (Russell Report);
Manpower Services Commission created with responsibilities for employment and training; “Employment and Training Act” – amended the Industrial Training Act;
“Work Experience” – enabled LEAs in Wales to provide work experience for pupils in last year of compulsory schooling.
- 1974** “Vocational Courses in Art and Design” DES;
“Pay of non-university teachers in Britain” (Houghton Report);
“Unqualified, Untrained and Unemployed.” Department of Employment
- 1976** Callaghan’s speech at Ruskin College advocating stronger links between education and industry
- 1977** “ Young People and Work” (Holland Report)
- 1978** “Management of Higher Education in the Maintained Sector” Cmnd 7130 (Oakes Report);
“Special Educational Needs” (Warnock Report);
Youth Opportunities Programmes (YOPs) set up to deal with increasing youth unemployment;
“HE into the 1900s” – discussion paper DES;
“School Examinations” advocated a common 16+ examination ultimately lead to GCSEs. (Waddell Report)

- 1979** “A Basis for Choice” (Mansell) FEU;
Proposals for a Certificate of Extended Education. (Keohane Report); “A Better Start in Working Life” DES
- 1980** “Foundation for Working Life” (Venn Report); “Engineering our Future” (Finniston Report); “Continuing Education: Post-experience Vocational Provision for those in Employment” DES
- 1981** “A New Training Initiative: A Programme For Action” Cmnd 8455 MSC;
“Employment and Training Act” lead to the 16 ITBs being abolished; “Legal Basis of FE”. DES/WO/LAA; “Vocational Preparation” FEU; “Education for 16-19 year olds” (Macfarlane Report); Open Tech. MSC
- 1982** “To consider how far the present scale and nature of provision for postgraduate education, meets manpower needs and to consider the role of the Research Councils”. (Swinnerton-Dyer Report);
“Teaching of Mathematics in Primary and Secondary Schools in England and Wales” with particular regard to the mathematics required in further and higher education, employment and adult life generally. (Cockcroft Report);
TVEI pilots launched; “Working Together – Education and Training” Cmnd 9823 DES/Employment Department
- 1983** “Education Act (Fees and Awards)” allowed universities and colleges to charge higher fees to overseas students;
Technical and Vocational Education Initiative introduced technical and vocational education for 14-18 year olds;
Certificate of Pre-Vocational Education (CPVE) introduced;
The Business and Technician Education Council (BTEC) created following the merger of TEC and BEC; SCOTEC and SCOTBEC merged to create SCOTVEC;
Youth Training Scheme replaced Youth Opportunities Programme;
“16-18s in Scotland – An Action Plan” Scottish Education Department
- 1984** “Training for Jobs” Cmnd 9135 DoE/DES;
“Better Schools” Cmnd 9469 DES;
“Competence and Competition”. MSC/NEDO; Secondary Examinations Council and School Curriculum Development Committee replaced Schools Council
- 1985** “The Development of Higher Education into the 1990s” Cmnd 9524 DES;
“Education and Training for Young People” Cmnd 9482 DES/MS;C;
“Employment-the Challenge for the Nation.” Cmnd 9474; “Further Education Act” gave polytechnics and colleges the same rights to sell education products and services as universities;
“Review of Vocational Qualifications” recommended the establishment of a National Council for Vocational Qualifications (NCVQ). Interim report 1985, final report 1986 and NCVQ created in 1987. (DeVill); “Academic Validation in Public Sector Higher Education” Cmnd 9501 (Lindop Report); “Better Schools”. Cmnd 9469 DES; “Managing Colleges Efficiently” DES; “Obtaining Better Value from FE”. Audit Commission. HMSO; “A Challenge to Complacency” MSC/NEDO

- 1986** GCSEs replace GCE O-level and the CSE examinations. First awards 1988; “Higher Education: Meeting the Challenge” Cm 114. DES;
Advanced Supplementary (AS) levels introduced;
Open College created to provide open access to training and reskilling formally known as the Open Tech; NCVQ created;
“Working Together – Education and Training” Cmnd 9823 DES/MS;C;
City Technology Colleges Trust formed. First City Technology College (CTC) opened in 1988; “Meeting the Challenge” Cm 114 DfEE;
“Managing Colleges Efficiently” HMSO
- 1987** “NAFE in Practice” HMI Survey;
“Working Together” Cmnd 9823 DES;
“Managing Colleges Efficiently”
- 1988** “Advancing A levels”. Proposed more coursework assessment and a wider range of subjects. (Higginson Report);
“Education Reform Act (ERA)”;
“Management Charter Initiative (MCI) launched;
“Training for Employment” Cmnd 316 proposed new Employment Training Scheme (ET);
“Employment for the 1990s” – proposed the creation of a taskforce for the TECs and the abolition of the remaining ITBs. Cmnd 540. ED;
Lead Bodies established and recognised to define standards for vocational awards;
National Curriculum Council and School Examinations and Assessment Council replaced School Curriculum Development Committee and Secondary Examinations Council;
MSC renamed the Training Commission (TC);
TC abolished;
“The National Certificate: A guide to Assessment” SCOTVEC

Changes in the titles of the central government education department since 1839

- 1839** Committee of Council on Education
- 1856** Education Department (ED)
- 1899** Board of Education (BoE)
- 1945** Ministry of Education (MoE)
- 1964** Department of Education and Science (DES)
- 1992** Department for Education (DfE)
- 1995** Department for Education and Employment (DfEE)
- 2001** Department for Education and Skills (DfES)
- 2007** The DfES was split up into two new departments namely the DCSF and DIUS

- 1989** Universities Funding Council (UFC) replaced the University Grants Committee;
 “Further Education: A New Strategy” – signalled the government’s intention to give FE a higher prominence DES;
 “Towards a skills revolution” (CBI); TECs – a prospectus for the 1990s DoE;
 “Skills 2000” TUC;
 “Productivity. Education and Training – Britain and other countries compared” NIESR;
 “Training in Britain – Survey of Funding, Activity and Attitudes” Department of Employment;
 Howie Committee established in Scotland
- 1990** Training credits prospectus for TECs and LECs;
 Training credits piloted in 11 TECs/LECs;
 “British Baccalaureat” IPPR;
 “Knowledge and Competition” MSC
- 1991** “Education and Training for the 21st Century” - recommended the creation of General National Vocational Qualifications (GNVQs) Cm 1536 2 vols DES;
 “Higher Education: A New Framework” Cm 1541. DES;
 Training and Enterprise Councils (TECs) established to manage training schemes such as Youth Training (YT);
 CPVE replaced by the Diploma of Vocational Education (DVE);
 National Records of Achievements (NRA) created;
 “Access and Opportunity: A Strategy for Education and Training” Cm 1530;
 “Science and technology education and employment” (ACOST);
 “Beyond GCSE” (Royal Society); “HE in FE” HMI Report;
 “A Strategy for Skills” Cm 1811 Department of Employment; “TVEI” HMI Report;
 “Choice and Diversity” DES
- 1992** “Further and Higher Education Act”:
 - Removed the binary line between universities and polytechnics;
 - Abolished the Council of National Academic Awards (CNAA);
 Incorporation of colleges – Further Education (FE), Tertiary Colleges and Sixth Form Colleges (SFCs) removed from Local Authority control and given financial independence;
 Further Education Funding Council (FEFC) created;
 General National Vocational Qualifications (GNVQS) piloted;
 “Choice and Diversity: a new framework for schools” Cm 2021;
 Upper Secondary Education in Scotland” (Howie Report) Scottish Office

- 1993** NCC and SEAC merged to create SCAA; GNVQs extended nationally;
Office for Standards in Education (OfSTED) formally created;
“Unfinished Business”. Audit Commission/OfSTED
- 1994** Teacher Training Agency (TTA) established; Modern Apprenticeships (MAs) introduced;
“Competitiveness – Helping Business to Win” Cm 2563 DTI;
“Higher Still: Opportunity for All” Scottish Office;
“Training for the Future” Scottish Office
- 1995** Dearing Report 1 “The National Curriculum and its Assessment” advocated simplification of the National Curriculum;
“Competitiveness: Forging Ahead” advocated strong links between education and employment Cm 2867 DTI;
Department for Education and Employment (DfEE) established;
NTOs Prospectus published;
“Technology foresight; leisure and learning” Office of Science and Technology;
“NVQs/GNVQs: Continuity or change” CGLI
- 1996** Edexcel created from merger of BTEC and the University of London Examinations and assessment Council (ULEAC);
“Review of 100 NVQs and SVQs” (Beaumont Report);
Dearing Review 2 “Review of Qualifications for 16-19 Year Olds” proposed that vocational courses should be available to 14+ pupils;
“Review of GNVQ Assessment” (Capey Report);
“Competitiveness: Creating the Enterprise Centre of Europe” Cm 3300 Cabinet Office;
“Learning to Compete: Education and Training for 14-19 Year Olds” Cm 3486;
Higher Level Vocational Qualifications. Position paper. DfEE;
“The Skills Audit” DfEE and Cabinet Office;
“Inclusive Learning”. (Tomlinson Report) FEFC;
“Review of 100 NVQs/SVQs” NCVQ/SCOTVEC;
“A Passport to Learning – learning credits” DfEE;
“Maximising Potential. New Options for Learning after 16 DfEE;
“Widening participation in FE and Training” FEFC; “
Work of TECs” Employment Department;
“Competitiveness: Helping Business to Win” DTI

- 1997** “Connecting the Learning Society: National Grid for Learning”;
Dearing Report 3 “Higher Education in the Learning Society” proposed an expansion in Higher Education (HE), introduction of income-contingent payment system;
SCAA and NCVQ replaced by the Qualifications and Assessment Council (QCA);
“Qualifying for Success – Future of Post-16 Qualifications DfEE;
“Learning Works: widening participation in further education” advocated the importance and centrality of learning and FE in improving social inclusion and economic prosperity. (Kennedy Report)
FEFC; New Deal (ND) launched; Learning and Earning Rathbone/NACRO et al
- 1998** “Teaching and Higher Education Act” created the General Teaching Council and compulsory qualification for Head Teachers, reformed teacher training, replaced the means-tested maintenance grant for HE students with an income-contingent loan system;
“The Learning Age; A Renaissance for a New Britain” Cmnd 3790;
University for Industry prospectus published;
“Learning is for everyone” Cm 3924. Welsh Office;
“FE” Education and Employment Select Committee. 2 vols.;
“Our Competitive future: building the knowledge-driven economy” DTI
- 1999** “Learning to Succeed: a new framework for post-16 learning”. Cm 4392 DfEE;
“Improving Literacy and Numeracy” Moser Report. DfEE;
Graduate Apprenticeships piloted;
Education Maintenance Allowances piloted
- 2000** “Learning and Skills Act” set up Learning and Skills Councils (LSCs), a new Youth Service – Con-neXions, reformed inspection structure for inspecting post-16 learning with an extended remit for Ofsted and the creation of the Adult Learning Inspectorate (ALI)
Qualifying for Success – changes in post-16 qualifications DfES
National Curriculum re visited;
Ufi became operational;
General Teaching Council established;
Modern Apprenticeships;
Foundation Degrees – consultation paper DfEE
- 2001** “Schools achieving success” Cm 5230 DfES;
“Centres of Vocational Excellence” LSC/DfEE;
“Skills for Life” DfES;
“Raising Standards – Teaching in FE” DfEE;
“Modern Apprenticeships – The Way to Work” (Cassels Report) DfES/LSC;
“Education into Employability – The role of the DfEE in the economy”. DfEE;
“Work Related Learning” DfES; Learning and Skills Council established;
Connexions created

- 2002** Learning and Skills Councils operational;
Sector Skills Councils (SSCs) established replacing the NTOs;
“14-19: Extending Opportunities, Raising Standards” proposed the introduction of more vocational GCSEs, a matriculation certificate, fast tracking for high achievers;
“Success for All Reforming FE and Training” DfES;
“SET for Success” (Roberts Report);
City Academies established;
“Success for All. Reforming FE and Training” DfES;
Vocational GCSEs introduced;
“Modern Apprenticeships – Framework”
- 2003** “The Future of Higher Education” Cm 5735 DfES;
“21st Century Skills Realising Our Potential” Cm 5810 DTI/DWP/DfES/Treasury;
“Developing a National Skills Strategy and Delivery” DfES;
“14-19 Opportunities and excellence” DfES 2 vols.;
“Learning from the trailblazer Sector Skills Councils”;
“Widening Participation in HE”
- 2004** University top up fees introduced;
“Skills in England” 4 vols LSC;
“An Employers Guide” and “Case Studies” Union Learning Representatives “HE Act”
- 2005** “14-19 Education and Skills” DfES;
“Learning and Skills – an agenda for change” Prospectus;
“Skills: Getting on in business, getting on in work”;
“Realising The Potential” – A Review of the future role of FE colleges” (Foster Report);
“Review of Skills” (Leitch Report) Treasury;
“Adult Skills”;
“Youth Matters”
- 2006** “Skills for Productivity” DfES/DTI;
“FE Reform: raising Skills. Improving Life Chances” DfES;
“Prior Qualifications of Adult Learners in FE and Work Based Learning” LSC;
“Youth Matters: Next Steps”;
Professionalising the workforce in FE”
- 2007** “Delivering World Class Skills in a Demand-Led System” (LSC/DfES)
“FE: Raising Skills. Improving Life Chances- Update” (DfES)
Ten Year Youth Strategy
“Third Sector Strategy and Action Plan”
“Ten Year Science and Innovation Framework” (BERR)
“Raising Expectations-staying on in education and training post-16”
“Government response to EU to establish new European Union Integrated Action Programme for Lifelong Learners”

Appendix ii

Biographies

6 short biographies of key people in the field of 'History of Technical Education'

George Birkbeck (1776 – 1841)

My selection of who matters in the history of technical education, like the history itself, is largely a personal choice. I want to draw attention to them as individuals, but I also want to pay tribute to the groups and movements they belonged to, which did so much to promote scientific and technical ideas – and in some cases, still continue to do so. The name of my first subject is well-known today because of the college he founded, although he himself has all but faded into the background.



George Birkbeck (1776 – 1841)

Birmingham may claim to have had the first Mechanics' Institute in Britain, but the initial idea emanated from Scotland. George Birkbeck was the instigator and driving force behind their creation. He qualified as a doctor of Medicine in 1799 and was appointed Professor of Natural Philosophy at

the Andersonian Institute in Glasgow at the tender age of 23. Birkbeck required equipment for his lectures and research, such as a centrifugal pump, and he commissioned the work from a Glasgow workshop. To his surprise and delight, he discovered that the workers wanted to know the principles of the apparatus they had been ordered to make:

For Birkbeck, it was impossible “not to determine that obstacle should be removed,” and so he invited the workers to attend his classes, subsequently opening a mechanics' class especially for them on Saturday evenings. They readily accepted his invitation and the attendances steadily grew – 75 at the first, rising to

500 for the fourth. The course lasted three months. It was repeated each year until Birkbeck left Glasgow in 1804, continuing to lecture on science in Birmingham, Liverpool and Hull, and finally settling in London.

Here, in 1809, he was instrumental with others in creating the London Institute located first in King's Arm Yard and later at Finsbury Circus. The Institute encouraged the pursuit of scientific and literary topics to the more educated populous. True to his Glasgow experiences, in 1823 Birkbeck wrote an essay on the need for scientific education of the working classes similar to the model he had developed in Scotland. A meeting was held on 11 November that year, which led to the establishment of the Birkbeck Literary and Scientific Institution. This pioneering institution ultimately became Birkbeck College, now part of the University of London. The college has remained true to his values and is a fitting tribute. A man of great vision, Birkbeck was one of the first to realise the danger of excluding the vast majority of society from any form of education and the positive impact including them would have on the motivation and productivity of the workforce.

For more information, see Kelly, T (1957): George Birkbeck, Pioneer of Adult Education. Liverpool University Press.

“I beheld, through every disadvantage of circumstance and appearance, such strong indications of the existence of unquenchable spirit. . . Why are these minds left without the means of obtaining that knowledge which they so ardently desire, and why are the avenues of science barred against them because they are poor?”

Sir Lyon Playfair (1818 – 1898)

Born in India and educated at St Andrew's in Scotland, this giant of the Victorian age studied chemistry at the Andersonian University of Glasgow, before going on to further study at University College London and Liebig's Laboratory at Giessen in Germany. Elected to an honorary chair at the Royal Institution in Manchester, he lectured at the Government School of Mines and served on many commissions throughout his life.

Playfair was also a politician, standing as a Liberal for the Universities of Edinburgh and St Andrews and elected MP for South Leeds in 1885. He held several senior positions in government, including Postmaster General and Vice-President of the Council of Education as well as Deputy Speaker of the House. As a noted and practising scientist, he was then – and would be today – a rare figure in politics, reaching a summit of scientific life as President of the British Association for the Advancement of Science.

Playfair travelled extensively in Europe and America. What he witnessed on his journeys showed how poorly the performance of the English technical education system compared with its economic rivals. In 1867 he wrote a letter to the Schools Inquiry Commission highlighting the weaknesses in manufacturing and mechanical industry and instruction in this country, making a strong plea for this to be con-

sidered by the Commission. Sadly, if unsurprisingly, his advice went largely unheeded.

Britain's performance in the Paris Exhibition that same year was embarrassingly poor. The extent of the decline over the previous fifteen years was illustrated by the number of palms of excellence awarded to Britain. In the Great Exhibition of 1851 Britain exhibited in 100 different departments and was awarded the palm in the majority, whilst in 1867 90 entries gave only 10 awards. Playfair's conclusion was succinct:

It is an analysis that would still be valid a hundred years later – the Great Exhibition was a significant stimulus to the promotion of science and technology, but it failed to be sustained because of a weak system of technical and management education.

Playfair continued to sound alarm bells about the future of Britain's industrial competitiveness, suggesting that victory in industrial power and performance would be with nations that commanded the greatest scientific skills. Presciently, he foresaw the emergence of America and Germany as the major competitors to Britain.

One of his greatest allies was Queen Victoria's consort Prince Albert, who had also studied in Germany and maintained a strong interest in science and technology. Indeed it was Albert who requested Playfair to tour Europe to study technical education first hand. The great scientist Thomas Huxley was another supporter, lending his eminent voice to lobby for improvements in scientific and technical education.

Playfair's final honour came when he received the Harben Gold Medal from the Royal Institute of Public Health in 1897. He died a year later at his home in South Kensington, and was buried in St Andrews. **T**

“The one cause of this inferiority upon which there was most unanimity is that France, Prussia, Austria, Belgium and Switzerland possess good systems of industrial education for the masters and managers of factories and that England possesses none.”

The Lunar Society (1765 – 1813)

A meeting place for inventors, scientists and natural philosophers – such was the purpose of the Lunar Circle, as it was known when it started in 1765, changing its name to the Lunar Society of Birmingham ten years later. Like the better-known Royal Society, the group comprised leading individuals from industry and science, but what made it special was that all its members were interested in the application of science to such disciplines as education, manufacturing, mining and transportation.

Meetings of the Society took place in members' homes including Soho House in Birmingham and in Lichfield. They were scheduled at the time of the full moon because travelling at night, when no street lighting existed, could be dangerous and many of the members had to travel a long way to get there. Members even referred to themselves as the 'lunatics'.

Lunatics

Membership of the Society was relatively small, around 12 to 14 at any one time, and represented some of the leading scientists and innovators of the time. The core group of 'lunatics' was made up of names to conjure with: Matthew Boulton, who created one of the first modern factories, James Watt of steam engine fame, Joseph Priestley who first isolated oxygen, scientist and industrialist Josiah Wedgwood and Erasmus Darwin, whose ideas on evolution antic-

ipated those of his more famous son. Others included Samuel Galton Junior, James Keir, William Murdock, John Whitehurst and William Withering. In addition the Society corresponded with and received visits from a succession of eminent individuals, among them Richard Arkwright, Benjamin Franklin, Thomas Jefferson and Anna Seward. The Society was particularly interested in chemistry but discussions ranged widely across many aspects of the emerging products and scientific techniques arising from the Industrial Revolution. Particular specialisms represented by the Society included ceramics, electrical technologies, engineering, geology, mining, manufacturing techniques, medical science and transportation systems, including canals. Unlike the later philosophical and literary societies which followed in its footsteps, the Lunar Society did not engage directly in discussions on politics or religion although they did discuss social, political and economic issues.

The Lunar Society may not have been not the only group of its kind – others existed in other parts of the country – but it was certainly one of the most remarkable gathering of polymaths of any time. Individually and through the Society, its members contributed greatly to the development of industrial processes and technical education. A present-day Lunar Society exists and aims, like its illustrious eighteenth-century predecessor, to play a leading part in the development of Birmingham and the wider region. **T**

Members of the Lunar Society meeting in the house of inventor James Watt



Sir Philip Magnus (1842-1933)

Soon after the City and Guilds of London Institute assumed responsibility for technological examinations from the Society of Arts they advertised for the position of an Organising Secretary and Director. The post was initially part-time and carried an annual salary of £400. The successful candidate was Philip Magnus, who subsequently became an influential figure in technical education and its development.

Magnus graduated from University College London with two degrees, one in science and the other in arts. After continuing his theological studies in Berlin, he returned to London as a minister. Gradually he became more involved in teaching, lecturing and examining, questioning the existing practices and systems of education and gaining a reputation as a radical. Despite this, his background and his undoubted ability to develop new and innovative approaches to technical education made him an ideal candidate for the position at City and Guilds.

One of his first challenges there was to manage the successful Technical School in Cowper Street, Lon-

don. Student numbers had grown significantly and the existing accommodation and facilities were now inadequate. An extensive range of evening classes was provided for artisans wanting to learn about the basic principles of their work. Classes were provided for chemists, dentists, engineers, telegraphics, and printers – the list was truly remarkable. Eventually, on 26 July 1880, the CGLI Executive Committee agreed to establish a new institution, and named it the Finsbury Technical College. Magnus was appointed as first Principal (1883-1885) and drafted its overall strategy.

The task of developing schemes of work and methods of instruction fell to three professors, Armstrong, Ayrton and Thompson. Thompson later became Principal of the College and held the post for thirty years. These three remarkable individuals pioneered new teaching techniques in science education particularly the experimental aspects of science and electricity. But Magnus was always the driving force behind the development of the college. Even at this time he was highlighting through his writings and lectures the massive investment in technical education being made in Germany compared with Britain and the consequences for Britain's industrial future.

Magnus wrote a seminal textbook on mechanics and his publication 'Industrial Education' (1888) is a classic of its kind. He was very influential in the development of the Central Institution located in South Kensington, opened in June 1884, which owed its existence to financial support from City and Guilds and the expertise of its director. Magnus was a member of the London School Board in 1890/1 and a fellow of the London University Senate. He became the leading authority on technical education and was a significant member of the Royal Commission on Technical Instruction, the Samuelson Report (1881 – 1884). **T**



Henry Brougham (1778 – 1868)

Henry Brougham was born in Edinburgh and entered Edinburgh University at the tender age of 14 to study mathematics and science. A fascination with optics led to an early paper on reflection and the colours of light. While at university he also developed an interest in law and later became a practising lawyer. He was involved in the founding of the *Edinburgh Review* (1802).

Brougham was elected as MP for Winchelsea and became very active in Parliament, where he was seen as being too radical – many of his ideas and attempts at reform were defeated. Throughout this political career he was a strong advocate for education and educational reform and supported the Ragged Schools Union and the Mechanics' Institutes. With a small group of like-minded others, he was instrumental in creating the London Mechanics' Institute in 1823. Two years later, in 1825, he wrote a seminal pamphlet entitled *Practical Observations upon the Education of People*. From 1827 he became one of the leading lights authors of the 'Library of Useful Knowledge', a comprehensive set of bi-weekly publications costing sixpence and focused on scientific themes.

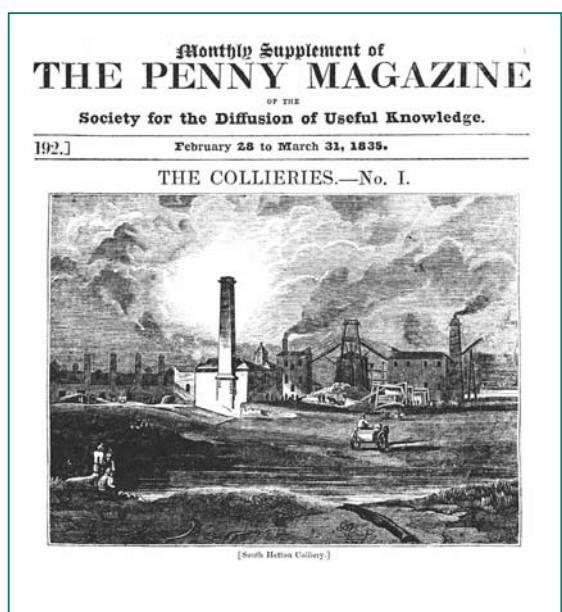
He became President of the Club and Institute Union, created in 1862, which was closely associated with the Working Men's Clubs and Institutes. Brougham sat on the Senate of the newly established University of London with Michael Faraday. He was a strong advocate for the rights of women and against slavery.

Society for the Diffusion of Useful Knowledge

The Society was launched in 1825 by Brougham and Matthew Davenport Hill, following an article in a journal by the radical Charles Knight deploring the woeful influence of the popular press on the working classes. Its purpose was to publish low-price books popularising science and general knowledge. A series of weekly and bi-weekly publications was produced, including the 'The Penny Magazine' and 'The Penny Cyclopaedia' as well as more expensive tomes such as a 'Gallery of Portraits'. Topics covered included history, geography and zoology.

The first publication in the Library of Useful Knowledge sold 33,000 copies, mainly to middle class readers. At its height of popularity, it was reckoned that there were 200,000 subscribers to the Penny Magazine per week, many of whom were artisans as well as the middle class. The publications did not engage in political or religious issues but were designed to appeal to workers who had just learned to read. A primary focus was on teaching artisans the scientific principles associated with their trades and imparting useful information.

The Society ceased most of its activities in 1848 as sales began to fall, with a small number of publications continuing for a few more years. Although ultimately unsustainable, it represents the first attempt to create a comprehensive and inexpensive range of educational literature for the masses. **T**



The Pitman dynasty

One inevitable consequence of the Industrial Revolution was a tremendous growth in the commercial, clerical and administrative support that business organisations required. The history of these developments, and the individuals associated with the creation of commercial and business processes, is as interesting and important as the history of technical education.

During the eighteenth century manufacturing, commercial and financial services enterprises, both small and large, grew at a rapid rate. The need to communicate increased exponentially and this necessitated more efficient and effective methods of managing business correspondence to customers and clients. Whether in cotton mills, heavy industrial companies, the rapidly expanding civil service or the military, managers wanted a quicker way of recording instructions to their staff and secretaries before these records were composed and transcribed into appropriate correspondence or other commercial documents.

As early as 1786, a shorthand system was developed by Samuel Taylor, based on an earlier system devised by John Byrom. But it was the system created by Isaac Pitman that was to revolutionise this valuable aid to commercial and business activity.



(Sir) Isaac Pitman (1813 – 1897)

The defining characteristics of Isaac Pitman – and indeed his brothers – were very similar to those of the other great pioneers of the Industrial Revolution. Pitman was largely self-taught, highly motivated and hard working as well as innovative and creative. Born in Trowbridge in 1813, he left school reluctantly at the age of 13 to start work as a clerk in a textile mill. Even though the working day was a full 12 hours, he and his brother Jacob studied at home before setting off for work at 6 a.m. and continued studying in the evenings after work. Isaac eventually qualified as a teacher and taught in a number of schools before founding his own school in Wotton-under-Edge in 1837.

In that same year he published his book ‘Stenographic Sound-Hand’, followed three years later by ‘Phonography’ – often referred to as the Penny Plate. This publication became the first correspondence course and was initially free of charge, with the penny simply covering the cost of postage. Pitman was passionate about education and wanted to “educate anyone of any class from anywhere who could read and had a desire to learn”.

The Pitman brothers

Isaac’s brothers, who greatly assisted the cascading of the system, were also remarkable individuals in their own right. Benn went to America in 1853 and introduced shorthand to the country, later becoming a famous engraver and court reporter before entering the world of design, where he helped to develop art and design education in the US. He reported many famous court cases, including the trial of the assassin of President Lincoln. Jacob went to Australia in 1837 where he too introduced the Pitman’s shorthand system whilst pursuing his initial training as a builder and architect specialising in building bridges.

A brief chronology of shorthand/ stenography

1588	'Characterie: An Arte of Shorte, Swifte and Secrete Writing by Character' by T. Bright published
1602	'Art of Stenography' by J. Willis published
1742	John Byrom's shorthand system copyrighted
1767	'Universal English Shorthand' by Bryrom published
1786	'Essay to establish standard for a universal system of stenography' by S. Taylor published
1810	Jacob Pitman born (died 1890)
1813	Isaac Pitman born (died 1897)
1822	Benn Pitman born (died 1910)
1829	Isaac Pitman took up Taylor's system
1837	'Stenography Sound-Hand' by Isaac Pitman published and introduced in Australia by Jacob Pitman
1839	Phonetic Institute opened in Bath by Isaac Pitman
1843	Phonographic Correspondence Society created in the UK
1845	Isaac Pitman established his first printing press
1851	Isaac Pitman won a bronze medal at the Great Exhibition
1852	Benn Pitman introduced the Pitman system in America
1864	The RSA introduces shorthand examinations
1870	Pitman's Metropolitan School opened in London
1888	Oxford Local Examining Board introduces shorthand examinations
1889	Pitman system was recognised by the government in the 'Technical Instruction Act'
1894	Isaac Pitman was knighted
1921	Pitman Commercial Examinations Department created
1985	Pitman Examination Institute sold to Longman Group

These seminal publications laid the foundations for his famous shorthand system which was ultimately adopted worldwide and translated into over thirty languages. Like earlier and later shorthand, Pitman's approach was based on the phonetic system, in which the symbols represent sounds rather than letters and are mainly written as the words are spoken. It quickly became the most widely used shorthand in Britain – adopted by the parliamentary stenographers to prepare Hansard – then the US and around the world.

Isaac Pitman's innovatory streak never deserted him. In 1870 he opened the Pitman's Metropolitan College, probably the first business education school in the world. Neither did his perfectionism, as he continued to revise the system that bore his name over many years up to his death in 1897.



James Pitman (1901 – 1985)

Sir Isaac Pitman's grandson James, born in 1901, continued the family business as chairman and joint managing director of the Pitman Press and Pitman Publishing companies. His career included the civil service, publishing, politics (representing Bath) and spelling reformer. He invented the Initial Teaching Alphabet and wrote extensively on the teaching of English. He served on the Management Committee of the Institute of Education, London and was Pro-Chancellor of the University of Bath. 

Glossary of Terms

All areas of human activity create and develop their own specialist language. The area of education and training is no exception to this rule and acronyms, abbreviations and special terms abound. The list below attempts to provide a reference of terms used in post-16 education and training. Although many of the terms are historical they still appear in documents. This glossary hopefully will cross reference with the history of technical education and the associated chronology. The list cannot hope to be perfectly accurate or complete but should provide a guide to the terminology, new organisations and initiatives that come and go with increasing rapidity but hopefully the list will be of use to the readership of 't' mag.

A

A	Advanced level	ACHMI	Audit Commission and Her Majesty's Inspectorate
AA	Advanced Apprenticeship	ACL	Adult and Community Learning
AACE	Army Certificate of Education	ACLF	Adult and Community Learning Fund
AACE	Association for Adult and Continuing Education	ACM	Association for College Management (Merged with CEF to form AoC)
AAD	Advanced Apprenticeship Diploma	ACME	Advisory Committee on Mathematics Education
AAES	Association of Agricultural Education Staff	ACOST	Advisory Council on Science and Technology
AAI	Association of Art Institutions	ACRA	Association of College Registrars and Administrators (Now merged with AoC)
A1	First year of Advanced Study	ACS	Average Class Size
A2	Second Year of Advanced Study	ACSET	Advisory Committee on the Supply and Training of Teachers
AB	Awarding Body	ACT	Association of Careers Teachers
ABE	Adult Basic Education	ACVET	Advisory Committee for Vocational Training
ABC	Awarding Body Consortium	ADAR	Art and Design Admissions Register/Registry
ABCC	Association of British Correspondence Colleges	ADES	Association of Directors of Education in Scotland
ABCC	Association of British Chambers of Commerce	AdFLAG	Adult Financial Literacy Advisory Group
ABCTG	Administration, Business and Commercial Training Group	AE	Adult Education
ABCUs	Association of British Credit Unions	AEA	Advanced Extension Awards
ABLSU	Adult Basic Literacy Study Unit	AEAS	Association of Educational Advisers in Scotland
ABRC	Advisory Board for the Research Councils	AEB	Associated Examining Board ('A' and 'O' levels)
ABSN	Adult Basic Skills Numeracy	AEC	Association of Education Committees
ABSSU	Adult Basic Skills Strategy Unit	AEO	Association of Education Officers
AC	Academy	AfC	Association for Colleges (Merged with CEF to form the AoC)
AC	Area Colleges	AFE	Advanced Further Education
AC	Audit Commission	AFEIS	Advanced Further Education Information Service
ACACE	Advisory Council for Adult and Continuing Education	AfL	Assessment for Learning
ACARD	Advisory Council on Applied Research Liaison	AGCAS	Association of Graduate Careers and Advisory Service
ACC	Association of County Councils	AGCS	Advisory Group on Content and Standards
ACCA	Qualification Curriculum and Assessment Authority for Wales	AHRC	Arts and Humanities Research Council
ACE	Advisory Centre for Education	ALBSU	Adult Literacy and Basic Skills Unit
ACE	Army Certificate of Education	ALC	Adult Learning Committee
ACFEC	Advisory Committee on FE for Commerce	ALF	Average Level of Funding
ACFHE	Associations of Colleges for Further and Higher Education		

ALG	Ault Learning Grant
ALH	Average Lecturer Hours
ALI	Adult Learning Inspectorate (Replaced the TSC)
ALL	Adult Literacy and Lifeskills Survey
ALLN	Adult Literacy, Language and Numeracy
ALM	Adult Learning Mathematics
ALMP	Active Labour Market Policies
ALNE	Adult Literacy, Numeracy and ESOL
ALP	Association of Learning Providers
ALS	Additional Learning Support
ALT	Association of Learning Technology
ALT	Association of Lecturers and Teachers
ALW	Adult Learners' Week
AMA	Association of Metropolitan Authorities
AMA	Advanced Modern Apprenticeship
aMA	Accelerated Modern Apprenticeship
AMB	Area Manpower Board (The regional offices of the MSC)
AMS	Annual Monitoring Survey
AoA	Association of Agriculture
AoC	Association of Colleges
AoN	Application of Number
APA/L	Accreditation of Prior Achievement/Learning
APC	Association of Principals of Colleges
APEL	Accreditation of Prior Experiential Learning
API	Age Participation Index
APL	Accreditation of Prior Learning
APR	Age Participation Rate
APT	Association of Polytechnic Teachers
APTI	Association of Principals in Technical Institutions
APU	Assessment and Performance Unit
APVIC	Association of Principals in Sixth Form Colleges
AQA	Assessment and Qualifications Alliance
AR	Apprenticeship Rate
ARCA	Adult Residential Colleges Association
ART	Association of Art Institutions
AS	Advanced Subsidiary Awards (Previously called Advanced Supplementary Awards)
ASDAN	Award Scheme Development and Accreditation Network
ASE	Association for Science Education
ASET	Accreditation Syndicate for Education and Training
ASET	Association for Sandwich Education and Training
ASH	Average Student Hours
ASL	Additional and Specialist Learning
ASLIB	Association of Special Libraries and Information Bureaux
ASNs	Additional Student Numbers
AST	Advanced Skills Teacher
ASTMS	Association of Scientific, Technical and Managerial Staff
AT	Attainment Target
ATB	Agriculture Training Board
ATC	Accredited Training Centre
ATC	Art Training Centres

ATCDE	Association of Teachers in Colleges and Departments of Education
ATO	Approved Training Organisation
ATO	Area Training Organisation
ATS	Adult Training Strategy (MSC programme)
ATT	Association of Accounting Technicians
ATTI	Association of Teachers in Technical Institutions
AUS	Association of University Administrators
AUT	Association of University Teachers
AVCE	Advanced Vocational Certificate of Education
AVPC	Association of Vice-Principals of Colleges

B

BAC	British Accreditation Council for Independent FE and HE Institutions
BACH	British Association of Construction Heads
BACIE	British Association for Commercial and Industrial Education
BAOL	British Association for Open Learning
BALID	British Association for Literacy in Development
BASIL	Basic Skills for Inclusive Learning
BB	British Baccalaureate
BBC - AL	BBC – Adult Learning
BCC	British Chambers of Commerce
BCED	British Council Education Department
BE	Basic Employability
BEC	British Employers Confederation
BEC	Business Education Council (Established in 1974 by the DES to plan a set of certificates and diplomas other than degrees)
BECTa	British Educational Communications and Technology Agency
BEM	Business Excellence Model
BERA	British Educational Research Association
BERR	Department for Business, Enterprise and Regulatory Reform
BESE	Board of Education Science Examinations
BET	Basic Employability Training
BILD	British Institute of Learning Disabilities
BIM	British Institute of Management
B-IT	Business – Improvement Techniques
BITC	Business in the Community
BL	Business Link
BLA	British Learning Association
BoE	Board of Education
BOND	Building on New Deal
BOPUs	Basic On Programme Units
BRE	Better Regulation Executive
BRTG	Better Regulation Task Group
BS	Basic Skills
BSA	Basic Skills Agency
BSARC	Basic Skills Agency Resource Centre
BSCF	Basic Skills Community Fund
BSQI	Basic Skills Quality Initiative
BSUS	Business Start Up
BTEC	Business Technician Education Council (TEC + BEC)
BTF	Bureaucracy Task Force
BVQR	Board for Vocational Qualifications Reform

C

C/Circ	Circular	CCW	Curriculum Council for Wales
CA	City Academies	CCWTE	Central Committee on Women's' Training and Employment
CA	Credit Accumulation	CDLs	Career Development Loans
CA	Community Action	CDP	Committee of Directors of Polytechnics
CAA	Computer Assisted Assessment	CDP	Community Development Programme
CABs	Component Awarding Bodies	CDT	Craft Design and Technology
CABE	Commission for Architecture and the Built Environment	CDU	Curriculum Development Unit
CAC	Central Advisory Council	CEA	Council for Educational Advance
CACC	Council for the Accreditation of Correspondence Colleges	CEDEFOP	European Centre for the Development of Vocational Training
CACE	Central Advisory Council for England	CEE	Certificate of Extended Education
CACGS	Computer-Aided Careers Guidance System	CEF	College Employers Federation
CACHE	Council for Awards in Children's Care and Education	CEF	Common European Framework
CACPD	Council for the Advancement of Communication with Deaf People	CEG	Careers Education and Guidance
CAD	Computer Aided Design	CEI	Council of Engineering Institutions
CAE	Computer Aided Engineering	CEL	Centre for Excellence in Leadership
CAFAS	Council for Academic Freedom and Standards	Ce-LP	Certified e-Learning Professional
CAFCASS	Children and Families Court Advisory and Support Service	CELP	College Employer Links Project
CAI	Computer Aided Instruction	CEP	Community Education Programme
CAL	Computer Aided Learning	CEP	Community Enterprise Programme
CALLMI	Computer Assisted Local Labour Market Information	CERI	Catering Education Research Institute
CAM	Computer Aided Manufacture	Cert Ed	Certificate of Education
CAPs	Credit and Access Pathways	CESI	Centre for Economic and Social Inclusion
CAO/SAO	Chief/Senior Administrative Officer	CET	Council for Education Technology
CASE	Campaign/Confederation for the Advancement of State Education	CETTs	Centres for Excellence in Teacher Training
CASE	Co-operative Awards in Science and Technology	CfBT	Centre for British Teachers
CASE(S)	Confederation for the Advancement of State Education (Scotland)	CfE	College of Further Education
CAST	Curriculum Advice and Support Team	CfET	computers for further education teachers
CAT	College of Advanced Technology	CfL	Campaign for Learning
CATE	Council for the Accreditation of Teacher Education	C - FP	Community – Focussed Provision
CATS	Credit Accumulation and Transfer Scheme	CGLI	City and Guilds of London Institute
CBE	Competency Based Education	CGTEA	Consultative Group for Training and Education in Agriculture
CBET	Competency Based Education and Training	CHE	College of Higher Education
CBEVE	Central Bureau for Educational Visits and Exchanges	CI	College Information
CBI	Confederation of British Industry	CI	Community Industry
CBL	Competency Based Learning	CIF	Common Inspection Framework
CBSS	Conjoint Board of Scientific Societies	CIHE	Council for Industry and Higher Education
CCA	Credit Common Accord	CIIL	Collaboration in Leadership
CCA	County Councils' Association	CILA	Compulsory Individual Learning Accounts
CCs	Commercial Certificates	CILT	Centre for Information on Language Teaching and Research
CC	County College	CIPD	Chartered Institute of Personnel and Development
CCEA	Northern Ireland Council for the Curriculum, Examinations and Assessment	CIPFA	Chartered Institute of Public Finance and Accountancy
CCETs	Community Consortia for Education and Training	CIS	College Information System
CCETSW	Central Council for Education and Training in Social Work	CIT	Committee on Industrial Training
CCDU	Counselling and Career Development Unit	CIT	Communication and IT
CCIS	Client Caseload Information System	CITB	Construction Industry Training Board
CCTE	Chamber of Commerce, Training and Enterprise	CLA	Copyright Licensing Agency
		CLAIT	Computer Literacy and Information Technology
		CLAW	Consortium, Local Authorities Wales
		CLEA	Council of Local Education Authorities
		CLMG	Campaign for Learning through Museums and Galleries
		Cm/Cmnd/Cd	Command Paper
		CMS	Career Management Skills
		CMT	College Management Team
		CNAA	Council for National Academic Awards

CO	Cabinet Office
COI	Central Office of Information
COIC	Careers and Occupational Information Centre
CoLRiC	Council for Learning Resources in Colleges
Comp	Comprehensive School
CoP/CP	College of Preceptors
COS	Certificate of Office Studies
COSHEP	Committee of Scottish Higher Education Principals
COSLA	Convention of Scottish Local Authorities
CoVE	Centre of Vocational Excellence
CP	Community Programme (MSC programme)
CPA	Comprehensive Performance Review
CPCE	Committee of the Privy Council on Education
CPD	Continuous Professional Development
CPRS	Central Policy Review Staff
CPVE	Certificate of Pre-Vocational Education
Cr/CrI	Circular
CRAC	Careers Research and Advisory Service
CRE	Commission for Racial Equality
CREDIS	Credit Framework (Wales)
CRQ	Centre for Research into Quality
CS	Community Service
CS	Central School
CSA	Council of the RSA
CSA	Care Standards Act
CSCI	Commission for Social Care Inspection
CSE	Certificate of Secondary Education
CSE	Civil Service Examinations
CSI	Customer Satisfaction Index
CSN	Careers Service National Association
CSO	Central Statistical Office
CSR	Comprehensive Spending Review
CSRU	Community Schemes Resources Unit
CST	Council for Science and Technology
CSV	Community Service Volunteers
CSYS	Certificate of Sixth Year Studies
CT	Credit Transfer
C3A	Colleges of the Third Age
CTC	Central Training Council
CTC	City Technology College
CTEB	Council of Technical Bodies
CTE(S)	Council for Tertiary Education (Scotland)
CTI	Computers in Teaching Initiative
CtL	Care to Learn
CTTE	Commerce Training and Enterprise
C2k	Curriculum 2000
CULE	Cambridge University Local Examinations
CVCP	Committee for Vice-Chancellors and Principals of Universities of the UK (Now called Universities UK)
CVE	Continuing Vocational Education
CVS	Council For Voluntary Services
CVU	Council of Validating Universities
CWDC	Children's Workforce Development Council
CWF	Cost Weighting Factor
CXPs	Connexions Partnerships
CY	Community School
CYEE	Central Youth Employment Executive
CYS	Community Special School
CYSA	Community and Youth Service Association

D

DAB	Diploma Awarding Body
DAB	Diploma Development Board
DATEC	The art and design committee of TEC
DBERR	Department for Business, Enterprise and Regulatory Reform
DCE	Diploma of Continuing Education
DCSF	Department of Children and Families
DDA	Disability Discrimination Act
DDPs	Diploma Development Partnerships
DE	Department of Employment
DEA	Development Education Association
DEAs	Disability Employment Advisers
DEFRA	Department for Environment, Food and Rural Affairs
DEIN	Department of Enterprise, Innovation and Network
DEL	Department of Employment and Learning
DELG	Distributed and e-Learning Group
DELLS	Department of Education, Lifelong Learning and Skills
DENI	Department for Education of the Northern Ireland Office
DEP	Department of Employment and Productivity
DES	Department of Education and Science
DCMS	Department of Culture, Media and Sport
DfE	Department for Education
DfEE	Department for Education and Employment
DfES	Department for Education and Skills (formerly DfEE and DES)
Dip AD	Diploma in Art and Design
DipHE	Diploma in Higher Education
DipTech	Diploma in Technology
DIUS	Department for Innovation, Universities and Skills
DLE	Demand-Led Element
DLF	Demand – Led- Funding
DoE	Department of Employment/Environment
DoH	Department of Health
DoI	Department of Industry
DoT	Department of Technology
DPSE	Diploma in Professional Studies in Education
DRC	Disability Rights Commission
DSA	Department of Science and Art
DSA	Disabled Students Allowance
DTI	Department of Trade and Industry
DTLR	Department for Transport, Local Government and the Regions
DTP	Desk Top Publishing
DVE	Diploma of Vocational Education
DWP	Department of Work and Pensions

E

EA	Education Act
E&D	Equality and Diversity
EAB	Examinations Appeals Board
EAEB	East Anglia Examinations Board (CSE examinations)
EAG	Evaluation Advisory Group
EARAC	East Anglian RAC

EAS	Enterprise Allowance Scheme	ESGE	Expenditure Steering Group for Education
EAV	Examining and Validating	ESL	English as a Second Language
EAZ	Educational Action Zone	ESOL	English for Speakers of Other Languages
EBP	Educational Business Partnership	ESRC	Economic and Social Research Council
EC(UK)	Engineering Council(UK)	ET	Employment Training
ECCTIS	Education Counselling and Credit Transfer Information Service	ET	Education and Training
ECDL	European Computer Driving Licence	ETAG	Education and Training Advisory Group
ECIS	Engineering Careers Information Service	ETDU	Examination Techniques Development Unit
ECITB	Engineering Construction Industry Training Board	ETF	Environmental Task Force
ECTS	European Credit Transfer System	ETG	Environmental Task Group (Part of the New Deal Programme)
ECY	Extended College Year	ETPs	Employer Training Pilots
ED	Employment Department	EU	European Union
EDAP	Employee Development and Assistance Programme	EV	External Verification/Verifier
Edexcel	Awarding body formed from the merger of BTEC and ULEAC	EYDCP	Early Years Development and Child Care Partnership
EDI	Electronic Data Interchange	EZs	Employment Zones
EDIMs	Equality and Diversity Impact Measures		
EDS	Employee Development Scheme	F	
EEC	Education and Employment Committee	FAB	Federation of Awarding Bodies
EEC	European Economic Commission	FACE	Forum for the Advancement of Continuing Education
EEN	Education for Enterprise Network	FAST	Forum for Assistive Training
EES	European Employment Strategy	FD	Foundation Degree
EFL	English as a Foreign Language	FDA	Foundation Degree in Arts
EGSA	Educational Guidance Service for Adults	FDF	Foundation Degree Forward
EHE	Enterprise in Higher Education	FDG	Foundation Degree Group
EIC	Employment Induction Course	FDS	Foundation Degree in Science
EiC	Excellence in Cities	FDS	First Destination Statistics
EIS	Educational Institute of Scotland	FDTF	Foundation Degree Task Force
EITB	Engineering Industry Training Board	FE	Further Education
ELLI	European Lifelong Learning Initiative	FEAT	Further Education Advisory Team
ELLIS	English Language Learning Instruction Service	FEC	Further Education College
ELWa	Education and Learning Wales (Created from merger of FEFCW and HEFCW)	FECDU	Further Education Curriculum Research and Development Unit (More commonly known as the FEU)
EMA	Educational Maintenance Award	Fed EE	Federation of European Employers
EMEU	East Midlands Educational Union	FEDA	Further Education Development Agency (Succeeded by FSDA)
EMFEC	East Midlands Further Education Council	FEI	Further Education Institute
EMIE	Education Management Information Exchange	FEFC	Further Education Funding Council
EMPNT0	Employment NTO	FEFCW	Further Education Funding Council Wales
EMREB	East Midland Region Examinations Board (CSE examinations)	FEMIS	Further Education Management Information Service
EMTA	Engineering and Marine Training Authority	fenc	Further education national consortium
ENB	English National Board (Nurse training)	FENTO	Further Education National Training Organisation
E 1,2&3	Entry levels 1, 2 & 3	FERAS	Further Education Revenue Account Survey
EO	Equal Opportunities	FERA	Further Education Research Association
EOC	Equal Opportunities Commission	FERL	Further Education Resources for Learning
EPA	Education Priority Area	FERN	Further Education Research Network
EPA	Equal Pay Act	FESC	Further Education Staff College (known more commonly as Coombe Lodge)
EPI	Employment Policy Institute	FESF	Further Education Standards Fund
EQF	European Qualification Framework	FESI	Further Education Sector Institution
ERA	Education Reform Act	FESR	Further Education Statistical Record
ERC	Employment Rehabilitation Centre	FET	FE and Training
ERSA	Employment Related Services Association	FETT	Further Education Teacher Training
ES	Employment Services	FEU	Further Education Unit (Succeeded by FEDA and then by LSDA)
ESD	Employment Services Division (Part of MSC)	FfA	Framework for Achievement
ESF	European Social Fund		
E2E	Entry to Employment		
ESG	Education Support Grant (Specific grant for the then DES)		

FFE/ffe	Framework for Excellence
FFORWM	The National Organisation for Further Education Colleges in Wales
FHE	Further and Higher Education
FL	Flexible Learning (Methods include open and distance learning, APL and transfer options)
FLLN	Family Literacy, Language and Numeracy
FLT	Foundation Learning Tier
FM	Functional Mathematics
FMA	Foundation Modern Apprenticeship
FRESA	Frameworks for Regional Employment and Skills Action
FS	Foundation School
FS	Functional Skills
FSA	Financial Service Agency
FSB	Federation of Small Businesses
FSMQ	Free Standing Mathematics Qualification
FSMUs	Free Standing Mathematics Units
FSSA	Financial Services Skills Academy
FT	Foundation Tier
FT	Full Time
FTC	Full Technological Certificate (CGLI)
FTE	Full Time Equivalent

G

GA	Graduate Apprenticeship
GCE	General Certification of Education
'G' Course	General Course
GC	Group Certificate
GCSE	General Certification of Secondary Education
GDP	Gross Domestic Product
GERBIL	Acronym for the General Education Reform Bill (1987)
GEST	Grants for Education, Support and Training
GFE(C)	General Further Education College
GIST	Girls into Science and Technology
GLH	Guided Learning Hours
GM	Grant Maintained
GNVQ	General National Vocational Qualifications (Advanced, Intermediate and Foundation)
GO	Government Office
GOLD	Gateway of Leadership Development
GP	Green Paper
GRIST	Grant-Related In-Service Training (Replaced by TRIST)
GS	General Studies
GSCC	General Social Care Council
GSVQ	General Scottish Vocational Qualification
GTC	General Teaching Council
GTCs	Government Training Centres
GTC(S)	General Teaching Council (Scotland)
GTP	Graduate Teacher Programme

H

HASWA	Health and Safety at Work Act
HCIMA	Hotel Catering and Institutional Management Association
HCOS	Higher Certificate in Office Studies
HCTB	Hotel and Catering Training Board
HE	Higher Education

HEA	Health Education
HED	HE Division
HEEPI	HE Environmental Performance Improvement
HEFC(E)	Higher Education Funding Council (England)
HEFC(W)	Higher Education Funding Council (Wales)
HEI	Higher Education Institute
HEIF	Higher Education Innovation Fund
HEIST	Higher Education Information Services Trust
HELM	Higher Education and the Labour Market
HEQC	Higher Education Quality Council (Succeeded by QAA)
HEQED	Higher Education: Quality and Employability Division
HERO	HE and Research Opportunities
HEROIC	Higher Education Reach Out to Industry and the Community
HESA	Higher Education Statistics Agency
HESDA	Higher Education Staff Development Agency
HMCI	Her Majesty's Chief Inspector
HMI	Her Majesty's Inspectorate
HMICA	Her Majesty's Inspectorate of Court Administration
HNC/D	Higher National Certificate/Diploma
HO	Home Office
HOC	
(Ed/S/A Comm)	House of Commons Education, Science and Arts Committee
HoD	Head of Department
Holland Report	'Young People at Work' , 1977, led to the creation of YOP
HRA	Human Rights Act
HRB	Humanities Research Board
HRD	Human Resources Department
HSC	Health and Safety Commission
HSC	Higher School Certificate
HSE	Health and Safety Executive
HSLC	Higher School Leaving Certificate
HT	Higher Tier
HTB	Hairdressing Training Board

I

IAG	Information Advice and Guidance Service
IAP	Individual Action Plan
IB	International Baccalaureate
IB	Information Bank
ICs	Instructional Centres
ICAC	Intermediate Certificate in Art and Crafts
ICAE	International Council for Adult Education
ICD	Institute of Careers Officers
ICEA	International Community Education Association
ICG	Institute of Careers Guidance
ICO	Institute of Careers Officers
ICT	Information Communication Technology
ICTF	Inner City Task Force
IE	Industry/Education Unit
IEA	Institute of Educational Assessors
IELTS	International English Language Testing System
IES	Institute for Employment Services
IFL	Institute for Learning

IFS	Institute of Fiscal Studies
IIE	Industry in Education
IIP	Investors in People
ILA	Individual Learning Account
ILB	Industrial Lead Body (Later became NTOs)
ILM	Institute of Leadership and Management
ILO	International Labour Organisation
ILP	Individual Learning Plan
ILR	Individual Learning Record
ILT	Information Learning Technology
ILT	Institute of Learning and Teaching
ILTHE	Institute of Learning and Teaching in Higher Education
IMA	Institute of Mathematics and its Application
IMS	Institute of Manpower Studies
INSET	In-Service Education and Training
IoD	Institute of Directors
IoP	Institute of Physics
IPDF	Industrial Partnership Development Fund
IPPR	Institute for Public Policy Research
IPR	Intellectual Property Rights
IQF	Integrated Qualifications Framework
IROs	Integrated Regional Offices
IRSCADE	Inter-Regional Standing Committee for Art and Design Education
IS	Industrial Society
IS	Information System
ISI	Institute for Scientific Information
ISR	Individual Student Record
IST	Institute of Science and Technology
IT	Industrial Training
IT	Information Technology
ITALS	Initial Teacher Award – Learning and Skills
ITB	Industry/Industrial Training Board
ITC	Industrial Training Council
ITE	Initial Teacher Education
ITEC	Information Technology Centre
ITEC	Information Technology, Electronics and Communication
ITNTO	IT National Training Organisation
ITO	Industry Training Organisation
ITP	Individual Training Plan
ITQ	IT Qualification
ITRU	Industrial Training Research Unit
ITT	Initial Teacher Training
ITTE	Initial Teacher Training Education
IV	Internal Verification/ Verifier
IWA	Institute for Welsh Affairs
IWF	Institutional Weighting Factor

J

JANET	Joint Academic Network (Network linking Universities and other HE Institutions)
JBPVE	Joint Board for Pre-Vocational Education
JCC	Joint Consultation Committee
JCGQ	Joint Council for General Qualifications
JCP	Job Creation Scheme (Short lived scheme introduced by MSC in 1975)
JC+/JCP	Job Centre Plus
JCQ	Joint Council for Qualifications

JES	Joint Efficiency Study
JETI	Jobs, Education and Training Information
JICs	Junior Instruction Centres
JIS	Job Introduction Scheme
JISC	Joint Information Systems Committee
JMA	Jobseekers Mandatory Activity
JMB	Joint Matriculation Board ('A' and 'O' levels)
JNC	Joint Negotiating Committee
JREI	Joint Research Equipment Initiative
JRS	Job Release Scheme
JSA	Jobseeker's Allowance
JSS	Job Splitting Scheme
JTS	Job Training Scheme (MSC programme)
JTS	Junior Technical School
JWT	Jobs Without Training

K

KPI	Key Performance Indicator
KS	Key Skills
KSA	Key Skills Assessment
KS 1/2/3/4 Curriculum	Key Stage (1 to 4 in schools) in National Curriculum
KSF	Knowledge and Skills Framework
KSSP	Key Skills Support Programme

L

LA	Local Authority
LA	Library Association
LA	Learning Aim
LAA	Local Authority Association
LACSAB	Local Authorities' Conditions of Service Advisory Board
LAD	Learning Aim Database
LAPSEC	Local Authority Post-School Education Co-ordinating Committee
LAR	Learner Achievement Record
LBs	Lead Bodies
LC	Learning Card
LCC	London Chamber of Commerce
LCCG	Learning Card Consultation Group
LCCI/LCCIEB	London Chamber of Commerce and Industry Examinations Board
LCCI/LCCIEB	London Chamber of commerce and Industry Examinations Board
LCP	Local Collaborative Project
LD	Learner Databank/Database
LDD	Learning Difficulties and/or Disabilities
LEA	Local Education Authority
LEACAN	LEA Curriculum Advisors Network
LEATG	Local Education Authority Training Grants Scheme
LEATS	Local Education Authority Training Scheme
LearnDirect (Ufi)	LearnDirect (University for Industry)
LEC	Local Enterprise Council (Scottish equivalent of the TECs)
LEN	Local Employer Networks
LET	Learning from Experience Trust
LeTTOL	Learning to Teach On-Line
LfLFE	Literacies for Learning in Further Education

LFS	Labour Force Survey
LGA	Local Government Association
LGTB	Local Government Training Board
LIBs	Lead Industry Bodies
LIC	Local Information Centre
LIF	Local Initiative Fund
LIN	Learning Information Network
LINC	Learning in Neighbourhood Centres
LLU	London Language and Literacy Unit
LLMI	Local Labour Market Information (Intelligence)
LLN	Language, Literacy and Numeracy
LLN	Lifelong Learning Network
LLPs	Local Lifelong Learning Partnerships
LLSC	Local Learning and Skills Council
LLUK	Lifelong Learning UK
LMC	Local Management of Colleges
LME	London Matriculation Examinations
LMI	Labour Market Information/Intelligence
LMS	Labour Market Survey
LMS	London Mathematical Society
LNE	Literacy, Numeracy and ESOL
LP	Learning Partnership
LP	Learning Programme
LRC	Learning Resource Centre
LRD	Labour Research Development
LREB	London Region Examinations Board
LRS	Learner Registration Service
LSC	Learning and Skills Council
LSCLSD	LSC Learner Support Directorate
L&S	Learning and Skills
LSDA	Learning and Skills Development Agency (formerly FEDA)
LSN	Learning and Skills Network
LSRC	Learning and Skills Research Centre
LSSF	Learning and Skills Standard Fund
LTAC	Local Technical Advisory Committee
LTSN	Learning and Teaching Support Network
LUEs	London University Examinations
LUEB	London University Extension Board
LVSRC	London Voluntary Sector Resource Centre

M

MA	Managing Agents
MA	Modern Apprenticeship
MAAC	Modern Apprenticeship Advisory Committee
MAFF	Ministry of Agriculture, Fisheries and Food
MARIS	Materials and Resources Information Service
MaSN	Maximum Student Number
MC	Matriculation Certificate
MDF	Mutual Development Fund (Managed by FEU/TA)
MEI	Mathematics in Education and Industry
MEP	Microelectronic Education Programme
MES	Museum Education Service
MI	Management Information
MIN	Modular Information Network
MIS	Management Information System
MLE	Managed Learning Environment
MLNS	Ministry of Labour and National Service

MODFC	College funded by the Ministry of Defence
MoE	Ministry of Education
MoT	Ministry of Technology
MSC	Manpower Services Commission
MSC	Management Standards Centre

N

NAA	National Assessment Board
NAAL	National Assessment of Adult Literacy
NAB	National Advisory Body for Public Sector HE (Replaced by PCFC)
NABCE	Non Award Bearing Continuing Education
NAC	National Apprenticeship Council
NACAB	National Association of Citizens Advice Bureaux
NACAE	National Advisory Council on Art Education
NACCE	National Advisory Committee on Creative and Cultural Education
NACEIC	National Advisory Council on Education for Industry and Commerce
NACETT	National Advisory Council for Education and Training Targets
NACP	National Association of Connexions Partnerships
NACRO	National Association for the Care and Resettlement of Offenders
NACVS	National Association of Councils for Voluntary Service
NAEGA	National Association for Educational Guidance for Adults
NAFE	Non-Advanced Further Education
NAGCELL	National Advisory Group for Continuing and Lifelong Learning
NAIEA	National Association of Inspectors and Educational Advisors
NALS	National Adult Learners Survey
NALT	National Association of Labour Teachers
NAO	National Audit Office
NAPAE0	National Association of Principal Agricultural Education Officers
NAPAG	National Academic Policy Advisory Group
NAPTSE	National Association for the Protection of Technical Education
NARIC	National Registration Information Centre
NASD	National Association for Staff Development
NASDFHE	National Association for Staff Development in F and HE
NATECLA	National Association for Teaching English and Other Community Languages to Adults
NATFHE	National Association of Teachers in Further and Higher Education
NATW	National Association of the Teachers of Wales
NAW	National Assembly of Wales
NBHS	National Bureau for Handicapped Students
NBR	National Base Rate
NCA	National Certificate in Agriculture
NCAT	National Centre for Alternative Technology
NC	National Certificate
NC	National Curriculum
NCAL	Nationwide Consultancy for Adult Learning
NCC	National Computing Centre
NCC	National Curriculum Council

NCDAD	National Council for Diplomas in Art and Design	NFET	National Framework for Education and Training
NCE	National Commission on Education	NFWI	National Federation of Women's Institutes
NCET	National Council for Educational Technology (Became BECTa)	NGfL	National Grid for Learning
NCETM	National Centre for Excellence in the Teaching of Mathematics	NHSU	National Health Service University
NCETW	National Council for Education and Training in Wales (ELWa)	NIACE	National Institute for Adult Continuing Education
NCF	National Curriculum Framework	NIAE	National Institute of Adult Education
NCFE	Northern Council for Further Education	NICEC	National Institute for Careers Guidance and Counselling
NCRVE	National Centre for Research on Vocational Education	NIESR	National Institute for Economic and Social Research
NCST	National Centre for Schools Technology	NIG	NAFE Implementation Group
NVG	National Consultative Group for the Co-ordination of Validation Arrangements in Agriculture and Related Subject	NIHEC	Northern Ireland HE Council
NCH	National Certificate in Horticulture	NILTA	National Information and Learning Technology Association
NCTA	National Council for Technological Awards	NISEC	Northern Ireland Secondary Examinations Council
NCTEC	Northern Counties Technical Examinations Council	NISS	National Information Services and Systems
NCTET	National Council for Teacher Education and Training	NJAC	National Joint Advisory Council
NCVO	National Council for Voluntary Organisations	NJEE	National Juvenile Employment Executive
NCVQ	National Council for Vocational Qualifications	NJTS	New Job Training Scheme
NCWE	National Council for Work Experience	NLN	National Learning Network
ND	New Deal	NLS	National Literacy Strategy
ND	National Diploma	NLSC	National Learning Skills Council
ND 50+	New Deal or the over 50s	NLSS	National Learners Satisfaction Survey
NDC	National Disability Council	NLT	National Learning Target
NDD	National Diploma in Design	NLT	National Literacy Trust
NDDP	New Deal for Disabled People	NMW	National Minimum Wage
NDIF	New Deal Innovation Fund	NNEB	Nursery Nurses Examination Board
NDLP	New Deal for Lone Parents	NOC	National Occupational Standards
NDLTU	New Deal for the Long-Term Unemployed	NOCN	National Open College Network
NDPA	New Deal Personal Adviser	NOF	National Opportunities Fund
NDPB	Non-Departmental Public Body	NOMS	National Offender Management Service
NDPU	New Deal for the Partners of the Unemployed	NOS	National Occupational Standards
NDYP	New Deal for Young Unemployed	NPFA	National Provider Financial Assurance
NEB	National Examination Board (Shorter title for NEBAHAI)	NPFS	National Planning and Funding System
NEBAHAI	National Examination Board for Agriculture, Horticulture and Allied Industries	NPS	National Preferred Scheme
NEBOSH	National Examinations Board in Occupational Safety and Health	NPTC	National Proficiency Test Council
NEBPN	National Education Business Partnership Network	NQAI	National Qualifications Authority of Ireland
NEBSM	National Examinations Board for Supervisory and Management	NQF	National Qualifications Framework
NEBSS	National Examination Board in Supervisory Studies	NR	National Route
NEC	National Extension College	NRA	National Record of Achievement
NEDC	National Economic Development Council	NRAG	National Rates Advisory Group
NEDO	National Economic Development Office	NRDC	National Retail Distribution Certificate
NEET	Not in Education, Employment or Training	NRDCALN	National Research and Development Centre for Adult Literacy and Numeracy
NEG	NAFE Evaluation Group	NREB	Northern Region Examinations Board
NEP	National Employment Panel	NROVA	National Record of Vocational Achievement
NET	Not in Education or Training	NRP	National Reference Point
NETP	National Employers Training Programme	NSA	National Skills Academy
NFEC	National Forum for Engineering in Colleges	NSDR	National Summary Data Report
NFER	National Foundation for Educational Research in England and Wales	NSEAD	National Society for Education in Art and Design
		NSF	National Skills Force
		NSSF	National Standardisation Strategic Framework
		NSTF	National Skills Task Force
		NSTOs	Non Statutory Training Organisations
		NT	National Traineeship (Replaced by FMA)
		NTA	National Training Award
		NTAC	National Trade Advisory Committee

NTET	National Targets for Education and Training
NTI	New Training Initiative
NTIs	New Technology Institutes
NTO	National Training Organisation (Succeeded by SSC)
NTOD	National Training Organisations Division
NTONC	National Training Organisation National Council
NTP	New Training Initiative
NTTS	New Job Training Scheme
NUS	National Union of Students
NUJMB	Northern Universities Joint Matriculation Board
NVH	New Vocational Horizons
NVQ	National Vocational Qualification
NVYOs	National Voluntary Youth Organisations
NWREB	North West Regional Examinations Board (CSE examinations)
NWS	New Workers Scheme

O

O	Ordinary level
OC	Open College
OCF	Open College Federation
OCN	Open College Network
OCR	Oxford Cambridge Royal Society of Arts Examination
OCSEC	Oxford and Cambridge Schools Examination Council ('A' and 'O' levels)
ODLE	Oxford Delegacy of Local Examinations ('A' and 'O' levels)
ODLQC	Open and Distance Learning Quality Council
OECD	Organisation for Economic Co-operation and Development
Ofsted	Office for Standards in Education
OGC	Office of Government Commerce
OLF	Open Learning Foundation
OLS	Open Learning System
OLSU	Offenders' Learning and Skills Unit
ONC/D	Ordinary National Certificate/Diploma
1 - 2 - 1	Replaced by Jobfinder Plus
ONS	Office for National Statistics
OPAL	Older People Active Learning
OPCS	Office of Population Censuses and Surveys
OPPs	On Programme Payments
OPSR	Office of Public Service Reform
OQC	Operations and Quality Committee
OR	Occupational Route
ORF	Output Related Funding
ORT	Organisation for Rehabilitation through Training
OSCs	Occupational Standards Councils
OST	Office for Science and Technology
OT	Other Training
OT	Open Tech
OTF	Occupational Training Family
OTJ	Off-the Job Training
OU	Open University

P

PAR	Programme Analysis and Review
PAT	Professional Association of Teachers
PBTE	Performance Based Teacher Education
PCAS	Polytechnics Central Admissions System
PCDL	Personal and Community Development Learning
PCET	Polytechnics Council for the Education of Teachers
PCET	Post Compulsory Education and Training
PCFC	Polytechnics and Colleges Funding Council
PDP	Personal Development Plan
PEDD	Professional Educational Development Division
PEI	Pitman Examination Institute
PEL	Paid Education Leave
PELTS	Personal Learning and Thinking Skills
PER	Professional and Executive Recruitment
PESC	Public Expenditure Survey Committee
PEVE	Post Experience Vocational Education
pFe	Platform for Employability
PFI	Private Finance Initiative
PGCE	Postgraduate Certificate in Education
PIs	Performance Indicators
PICKUP	Professional, Industrial and Commercial Updating Programme (Programmes for employed adults)
PIDA	Public Interest Disclosure Act
PISCI	Pre-Inspection and School Context Indicator
PIU	Performance and Innovation Unit
PJA	Personal Job Account
PL	Principal Learning
PLAR	Prior Learning Assessment and Recognition
PLRAP	Planning Learning and Recording Achievement and Progress
PLSU	Prisoners Learning Skills Unit
POS	Programme of Study
PPP	Public Private Partnerships
PRAISE	Pilot Records of Achievement in Schools Evaluation
PRO	Public Records Office
PRT	Programme Review Team
PSA	Public Service Agreement(s)
PSHE	Public Sector Higher Education
PSI	Policy Studies Institute
PSS	Peoples Skills Scoreboard
PT	Part Time
PTP	Private Training Provider
PV	Private and Voluntary
PVS	Private and Voluntary Sector
PW	Programme Weighting

Q

QA	Quality Assurance
QAA	Quality Assurance Agency
QC	Quality Control
QCA	Qualifications and Curriculum Authority (Formed by the merger of SCQA and NCVQ)
QCF	Qualifications and Credit Framework
QE	Quality Enhancement

QET	Quality in Education and Training
QIA	Quality Improvement Agency
QNCA	Qualifications and National Curriculum (Initial title for QCA)
QUANGO	Quasi Autonomous Non-Governmental Organisations
QUILT	Quality Information and Learning Technology
QSC	Quality and Standards Committee
QTLS	Qualified Teacher of Learning and Skills
QT(S)	Qualified Teacher (Status)
Qualdat	JCQ data base

R

RACs	Regional Advisory Councils (These were established in 1946 to ensure co-operation between authorities and co-ordinate the provision of both AFE and NAFE-now disbanded)
RAE	Research Assessment Exercise
RANSC	Records of Achievement National Steering Committee
RAPAL	Research and Practice in Adult Literacy
RARPA	Recognising and Recording Progress and Achievement in non-accredited learning
RBL	Resource Based Learning
RCB	Regional Curriculum Board
RCCDE	Regional Council for Colleges and Departments of Education
RCP	Responsive College Project
RCR	Royal Commission Report
RCT	Royal College of Technologists
RCU	Responsive College Unit
RDA	Regional Development Agency
REBs	Regional Examination Boards/Bodies
REFED	Refugee Education and Employment Programme
REPLAN	DES programme to promote development of educational opportunities for the adult unemployed
RESTART	MSC programme for the long-term unemployed
REUs	Regional Examining Unions
RI	Reporting Inspector
RIA	Regulatory Impact assessment
RIS	Regional Innovation Strategy
RMC	Regional Management Centre
RMCA	Regional Management Centre Association
RoA	Record of Achievement
RoC	Rules of Combination
ROSLA	Raising of the School Leaving Age
RQA	Raising Quality and Achievement
RRA	Race Relations Act
RS	Royal Society
RSA	Royal Society of Arts
RSC	Royal Society of Chemistry
RSG	Rate Support Grant
RSI	Regional Staff Inspector
RSP	Regional Skills Partnerships
RSSL	Recruitment Subsidy for School Leavers
RtA	Route to Achievement
RTG	Real Term Guarantee
RTOs	Registered Training Organisations

RVCF	Regional Venture Capital Funds
RVQ	Review of Vocational Qualifications
RVQs	Related Vocational Qualifications
RWE	Realistic Working Environment

S

SA	Skills Academies
SA	Skills Alliance
SA	Student Apprenticeship
SAs	Subject Advisors
SAAS	Student Awards Agency for Scotland
SACCA	Scottish Advisory Committee on Credit and Access
SAD	Science and Art Department
SAL	Supported Autonomous Learning
SANCAD	Scottish Association for National Certificates and Diplomas
SAR	Self Assessment Report
SAR	Students Attendance Ratio
SBC	Small Business Council
SBN	Skills for Business Network
SBS	Small Business Service
SC	School Certificate
SC	Schools Council
SC	Select Committee
SCAA	Schools' Curriculum and Assessment Authority
SCCAPE	Scottish Council for Commercial Administration and Professional Education
SCET	Scottish Council for Educational Technology
SCDC	School Curriculum Development Committee
SCETT	Standing Conference for the Education and Training of Teachers in the Public Sector
SCONUL	Standing Conference of National and University Librarians
SCOP	Standing Committee of Principals
SCOTBEC	Scottish Business Education Council
SCOTCATS	Scottish Credit Accumulation and Transfer Scheme
SCOTEC	Scottish Technician Education Council
SCOTVEC	Scottish Vocational Education Council
SCPR	Social and Community Planning Research
SCQF	Scottish Credit and Qualifications Framework
SCR	Select Committee Report
SCRAC	Standing Conference of Regional Advisory Councils
SCRE	Scottish Council for Research into Education
SCREB	Standing Conference of Regional Examination Boards
SCSST	Standing Conference on Schools' Science and Technology
SCTEB	Standing Conference of Technical Examining Bodies
SCUE	Standing Conference on University Entrance
SD	Specialised Diploma
SDA	Skills Development Advisors
SDA	Severe Disability Allowance
SDA	Sex Discrimination Act
SDF	Staff Development Fund
SDUK	Society for the Diffusion of Useful Knowledge
SE	Scottish Executive

SEAC	School Examination and Assessment Council (Became SCAA)	SS	Skills Strategy
SEB	Scottish Examination Board	SSAs	Sector Skills Agreements
SEC	Schools Examination Council	SSA	Sector Subject Area
SEETLLD	Scottish Executive Enterprise. Transport and Lifelong Learning	SSA	Standard Spending Assessment
SEDA	Staff and Educational Development Association	SSAT	Specialist Schools and Academies Trust
SEMTA	Science, Engineering and Manufacturing Technologies Alliance	SSCs	Skill Sector Councils (Replaced NTOs)
SEN	Special Educational Needs	SSEC	Secondary School Examinations Council
SENDA	Special Education Needs and Disability Act	SSDA	Sector Skills Development Agency
SEO	Scottish Education Office	SSR	Staff Student Ratio
SEOs	Society of Education Offices	SSRC	Social Science Research Council
SERC	Science Engineering Research Council	SSTA	Scottish Secondary Teachers Association
SEREB	South East Regional Examinations Board (CSE)	STC	Short Training Course
SETNET	Science, Engineering, Technology, Mathematics Network	STEAC	Scottish Tertiary Education Advisory Council
SEU	Standards and Effectiveness Unit	STEP	Special Temporary Employment Programme (MSC programme)
SF	Standards Fund	STF	Scottish Training Federation
SfB	Skills for Business	STF	Skills Task Force
SfBN	Skills for Business Network	STF	Standards Task Force
SFCEF	Sixth Form Colleges Employers' Forum	SUJBSE	Southern Universities Joint Board for School Examinations ('A' and 'O' levels)
SFEDI	Small Firms Enterprise Development Initiative	SVQ	Scottish Vocational Qualification
SFEFC	Scottish FE Funding Council	SVQRB	Strategic Vocational Qualifications Reform Board
SFES	Small Firms Employment Subsidy	SVUK	Standards Verification UK
SFEU	Scottish FE Unit	SWAP	Scottish Wider Access Programme
SFL	Skills for Life	SWEB	South West Examinations Board (CSE examinations)
SfLH	Skills for Life and Health		
SfLIP	Skills for Life Improvement Programme	T	
SfLQ	Skills for Life Qualification	'T' Course	Technician Course
SfLQI	Skills for Life Quality Initiative	TA	Training Agency (A short lived title for the former MSC)
SfLSU	Skills for Life Strategy Unit	T&D	Training and Development
SFR	Statistical First Release	TAG	Technical Advisory Group
SHEFC	Scottish Higher Education Funding Council	T&L	Teaching and Learning
SIAD	Society of Industrial Artists and Designers	TALENT	Training Adult Literacy, ESOL and Numeracy
SIC	Standard Industrial Classification	TAP	Training Access Point
Skill	National Bureau for Students with Disabilities	TC	Technical Certificate
SLC	Student Loan Company	TC	Tertiary College
SLDD	Students with Learning Difficulties and Disabilities	TC	Training Centre
SLS	Social and Life Skills	TC	Training Commission (A short lived title for the former MSC)
SMART	Specific, Measurable, Achievable, Realistic and Time Bound	TCs	Training Credits
SMEs	Small and Medium Enterprises	TCA	Tertiary Colleges Association
SMMT	Society of Motor Manufacturers and Traders	TCR	Teacher Contract Hours
SMT	Senior Management Team	TCS	Teaching Company Scheme
SoA	Society of Arts	TCT	Technology Colleges Trust
SOC	Standard Occupational Classifications	TDA	Training and Development Agency for Schools
SOED	Scottish Office Education Department	TDG	Technical Data Group
SPD	Special Programme Division (MSC)	TDLB	Training and Development Lead Body
SQA	Scottish Quality Authority	TEB	Technical Education Board
SQMS	Scottish Quality Management System	TEC	Technician Education Council
SQS	Sector Qualifications Strategies	TECNC	Training and Enterprise Councils National Council
SRB	Single Regeneration Budget	TECs	Training and Enterprise Councils
SRCFE	Southern Regional Council for Further Education	TEED	Training , Enterprise and Education Directorate
SREB	Southern Regional Examinations (CSE examinations)	TEN	Training and Employment Network
SRHE	Society for Research into Higher Education	TES	Times Education Supplement
		TES	Temporary Employment Subsidy

TfT	Technologies for Training
TFT	Technology and Flexible Training
TfW	Training for Work
TGVS	Task Group on Vital Skills
THES	Times Higher Education Supplement
TiE	Technology in Education
TIS	Travel to Interview Scheme
TLTP	The Teaching and Learning Technology Programme
TOC	Training Occupational Classification
TOPS	Training Opportunities Scheme
TP	Teachers' Pensions
TPI	Teachers Pay Initiative
TQA	Total Quality Assessment
TQM	Total Quality Management
TRACE	Training for and Approaches to Careers Education
TRADEC	Trades Education Courses
TRC	Teacher Registration Council
TRIST	TVEI-Related In-Service Training
TSA	Training Standards Agency
TSC	Training Standards Council (replaced by ALI)
TSD	Training Services Division (Part of the MSC)
TSO	The Stationery Office (HMSO)
TSP	Training for Skills Programme
TT	Teacher Training
TTA	Teacher Training Agency
TtG	Train to Gain
TfW	Training for Work
TTWA	Travel to Work Area
TU	Trade Union
TUC	Trade Union Congress
TUEO	Trade Union Education Officer
TUCET	Trade Union Congress Education Trust
TULR	Trade Union Learning Representative
TVEI	Technical Vocational Education Initiative
TWs	Training Workshops
TWIAS	Training Within Industry Advisory Service

U

UABs	Unitary Awarding Boards/Bodies
UACE	Universities Association for Continuing Education
UBI	Understanding British Industry
UBS	Unit Based System
UCAS	Universities and Colleges Admissions Service
UCCA	Universities Central Council on Admissions
UCEA	Universities and Colleges Employers Association
UCET	Universities Council for the Education of Teachers
UCISA	Universities and Colleges Information Systems Association
UCLES	University of Cambridge Local Examinations Syndicate
UCoSDA	Universities and Colleges Staff Development Agency
UCU	University and College Union (AUT+Natfhe)
UD	Unit Databank
UDACE	Unit for the Development of Adult Continuing Education

UDC	Urban Development Corporation
UDEs	University Departments of Education
UDE	University Diploma of Education
UDILs	University Directors of Industrial Liaison
UEB	University Extension Board
UEI	Union of Educational Institutions
UESEC	University Entrance and School Examination Council
UFC	Universities Funding Council
Ufi	University for Industry
UGC	University Grants Council
UI	Understanding Industry
UKBVQR	UK Board for Vocational Qualifications Reform
UKCOSA	United Kingdom Council for Overseas Student Affairs
UKRLP	UK Register for Learning Providers
UKSC	United Kingdom Standing Conference of Management Heads
ULCI	Union of Lancashire and Cheshire Institutions
ULF	Union Learning Fund
ULN	Unique Learner Number
ULR	Union Learning Representative
UMS	Unit of Manpower Studies
U3A	University of the Third Age
UoD	Unit of Delivery
UROP	Undergraduate Research Opportunities Programme
UUK	Universities UK
UVAC	University Vocational Awards Council
UVP	Unified Vocational Preparation (DES and TSD programme)

V

VABs	Vocational Awarding Bodies
VASFE	Vocational Aspects of Secondary and FE
VCE	Vocational Certificates in Education
VCEA/Level	Vocational Certificate of Education Advanced Level
VCOs	Voluntary and Community Organisations
VCS	Voluntary and Community Sector
VET	Vocational Education and Training
VFM	Value for Money
VLE	Virtual Learning Environment
VPP	Voluntary Projects Programmes
VQRP	Vocational Qualifications Reform Programme
VRQs	Vocationally Related Qualifications
VSF	Voluntary Sector Fund

W

WABLA(HE)	Welsh Advisory Body for Local Authority Higher Education
WB	Welsh Baccalaureate
WBA	Web Based Assessment/Accreditation
WBA	Work Based Assessment
WBL	Work Based Learning/Learner
WBLA	Work Based Learning for Adults
WBLP	Work Based Learning Project
WBLYP	Work Based Learning for Young People
WBP	Work Based Project

WBSN	Work Basic Skills Network
WBTA	Work Based Training for Adults
WDCs	Workforce Development Confederations
WDSU	Workforce Strategy Unit
WE	Work Experience
WEA	Workers Educational Association
WEED	Work Experience on Employers Premises
WEP	Work Experience Programme
WF	Work Foundation
WfD	Workforce Development
WIC	Work Introduction Course
WISK	Work Skill Course
WJEC	Welsh Joint Education Committee
WLN	Women's Leadership Network
WMACFE	West Midlands Advisory Council for Further Education
WMEB	West Midland Examinations Board (CSE examinations)
WO	Welsh Office
WOP	Wider Opportunities Training Programme
WP	White Paper
WP	Widening Participation
WPU	Widening Participation Unit
WRNAFE	Work Related Non-Advanced Further Education
WWW	World Wide Web

XYZ

YA	Young Apprenticeship
YALP	Young Adults Learners' Partnership/Project
YC	Youth Credit
YCS	Youth Cohort Survey
YPLC	Young People's Learning Committee
YE	Young Enterprise
YEI	Youth Enterprise Initiative
YES	Youth Employment Subsidy/Service (An MSC scheme)
YHAFHE	Yorkshire and Humberside Association for Further and Higher Education
YHREB	Yorkshire and Humberside Regional Examinations Board (CSE examinations)
YJB	Youth Justice Board
YOP	Youth Opportunities Programme was under the Special Programmes Division on the MSC
YOUTH AID	Youth Unemployment Pressure Group
YS	Youth Service
YSF	Youth Service Forum
YSS	Youth Support Service
YT	Youth Training
YTP	Youth Training Programme
YTS	Youth Training Scheme
YUMI	Yorkshire Union of Mechanics Institutes
YWS	Young Workers Scheme
ZZB	Zero Based Budget

Revised and updated July 2007, R.G.Evans

Appendix iii

Useful book references

The following book list references texts I have found useful whilst writing the history and compiling the chronology. Many are out of print but most can be obtained via inter-library loan, via internet book companies or from second hand bookshops. I hope the list proves of value to the readers.

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