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Chapter

Perspective Chapter: Reflections on the Future of Higher Education in the United Kingdom

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Abstract

The problems being faced in the UK universitysector are considered, how these problems have arisen, what needs to be done about them, and, how the future of the UK's knowledge economy will be influenced by the strategies currently being implemented by the UK government. This is done by revisiting some examples of problems from the past, and how they were solved. This is undertaken using a framework that is characterised by the following fundamental issues: (i) educational philosophies; (ii) ethics in educational provision; (iii) knowledge economies, and; (iv) the goals of education. In this context, the chapter discusses the evolving, and necessary connectivity, between government, education and industry - the so-called 'Triple Helix Concept'. This is coupled with a discussion on the future of Higher Education in terms of the underlying strategy of the UK government, which reflects the new age of the 'Technological College' that the UK is now entering.

Keywords: higher education, educational philosophies, apprenticeship Programmes, technological colleges, government strategy

1. Introduction

In this chapter, the current problems being faced in the UK university sector are considered, how these problems have arisen, what needs to be done about them, and how the future of the UK's knowledge economy will be influenced by the strategies now being implemented by the government. This is done by revisiting some examples of problems from the past and how they were solved, lest we fail to appreciate the words of the Spanish Philosopher, George Santayana [1]: 'Those who do not remember the past are condemned to repeat it'. In this context, the chapter considers the state of Higher Education (HE) in the United Kingdom. This is undertaken using a framework that is characterised by the following fundamental issues:

i. Educational philosophies;

ii. ethics in educational provision;

iii. knowledge economies, and;

iv. the goals of education.

The chapter considers how and why the UK's apprenticeship centres were established in the 1880's as a direct consequence of social and economic issues that led to problems which are very familiar today. The chapter also briefly considers the background to a reformation in English education that occurred in the 1650's and the longer term effects it had on society in both the UK and beyond. In this context, the chapter discusses the evolving and necessary connectivity between government, education and industry - the so-called 'Triple Helix Concept' [2]. This is followed by a discussion on the future of education in terms of the underlying strategy of the UK government. It is undertaken by considering two case studies that are reflective of the new age of the 'Technological College' that the UK is now embarking upon; colleges that are destined to replace many rank-and-file universities. The concluding remarks are coupled with some final thoughts in regard to a generic educational philosophy for the future.

2. Educational philosophies

In his book *Novum Organum* [3], Sir Francis Bacon introduces the four 'Idols of the Mind' and asserts that each of these 'Idols' prevents human beings from attaining a true understanding of things. His 'Idol of the Tribe', is the tendency to treat human observation and reason as infallible, forgetting that all humans tend to distort what they perceive. The 'Idol of the Marketplace' is the debasement of words and their misuse to generate propaganda as we refer to it today, twisting words to obscure the truth. His 'Idol of the Theatre' concerns the belief in dogmas or systems of philosophy that distort reality. Like a work of drama in a theatre, these systems are only approximations or models of the truth. In terms of education, Bacon's 'Idol of the Cave' is most appropriate. This is the idol that concerns the individual human tendency to treat our own ideas as objective and not to take into account that all individual human wisdom is subjective and coloured by one's own experiences. In this way, people tend to become blind to their passions and enthusiasm, their devotions and ideologies, which leads to a misunderstanding in the true nature of things [4]. And this is where education plays such a vital role, by providing resistance to Bacon's 'Idol of the Cave'.

For Francis Bacon, education was an indispensable aid to progress in society including moral progress. His view was that education would lead to a greater body of the population that could, 'read not to contradict and confute, nor to believe and take for granted, but to weigh and consider'. Such views were of course the antithesis of his times, in which the belief systems of a strictly monotheistic society were a source of authority and control and not to be weighed in the balance but adopted as an absolute truth. In this sense, many of Bacon's philosophical ideas were nothing new but part of the Renaissance and the age of enlightenment, based on the re-birth of Hellenism throughout Europe that was taking place in his time and continues to this day.

In the context of Bacon's 'Idol of Cave', there are two quotes that are motivational in terms of educational philosophies. The first of these is from the 'Lord of Reason' Bertrand Russell who was one of Britain's finest mathematicians and philosophers and had a profound influence on the developments in Artificial Intelligence and Analytical Philosophy, for example, winning the Nobel Prize for Literature in 1950. Russell was also an outspoken social critic and a vehement advocate of freedom of expression

stating that, 'We are faced with the paradoxical fact that education has become one of the chief obstacles to intelligence and freedom of thought' [5]. This is a statement that should appeal, to many academics having to deal with an army of administrators that frequent today's universities and fail to understand that their purpose is to support scholars for the sake of the students and not to control them and the curriculum that is exercised, especially, when it emanates from central government.

Russell's statement, that of education being an obstacle to intelligence and freedom of thought, is perhaps closely related to another observation, which is from a very different and earlier source. In 1766, James Boswell published a book on the 'Life of Dr Samual Johnson'. In regard to education, Johnson is said to have stated the following: 'Talking of education, people now days have got a strange opinion that everything should be taught by lectures. Now, I cannot see that lectures can do so much good as reading the books from which the lectures are taken. I know nothing that can be best taught by lectures, except where experiments are to be shown. You may teach chemistry through lectures; you might teach the making of shoes with Lectures' [6].

It is arguable that of many subjects that Johnson could have considered by way of examples in regard to being taught by lectures, chemistry and the making of shoes are not appropriate, as both are practical laboratory-based, and hands-on activities, respectively. Nevertheless, the point that Johnson makes is very relevant today, and is a reflection of the transition that is now taking place. Instead of school leavers going to a university so that they can be lectured to, they are now being encouraged to enter 'earn as you learn' apprenticeships, where they can obtain the hands-on training required to develop a career. To learn how to actually do things and make things, as opposed to attending lectures and then talking about them in the cloisters of a university. In this respect, the German-based apprenticeship scheme, for example, has been an ideal model to adopt for many years.

Bertrand Russell's observation that education is one of the chief obstacles to intelligence and freedom of thought is a reflection of the current problem. Johnson's observation, that nothing can be best taught by lectures is a reflection of the solution. That is, and, as will be discussed later, the development of new 'Technological Colleges' in which student apprentices are properly trained by industry-based experts in subjects that are relevant to the economic development of the state.

In respect of the educational philosophy considered in this chapter, a new approach to HE is in the process of being forged through the introduction of new apprenticeship programs which are set to replace conventional university activities. In the UK, the 2020 vision was set to address the imbalance that has occurred given that 'A nation flourishes when it realises the full potential of all of its people. As a one-nation Government, this is what we are committed to achieve. Around the world, apprenticeships have long been recognised as a crucial way to develop the skills wanted by employers. That is why the Government will increase the quality and quantity of apprenticeships in England, reaching three million starts in 2020' [7]. The reasons for introducing this vision, which has yet to be achieved in the UK, are embedded in a problem that lies at the heart of Ethics in Educational Provision as discussed in the following section.

3. Ethics in educational provision

There was a time when education focused on the 'three R's'; Reading, Writing, and Arithmetic. Now we have a situation in which the 'three D's' are prevalent; Degree, Dole, and Debt [8]. It is, a quite appalling realisation, that there is now a steady 'flow' of UK graduates, going from a graduation ceremony straight into unemployment,

after having been burdened with an average debt of the order of 50,000 GBP in student fees, accommodation and other living costs. And this is more often than not for the privilege of being able to receive nothing more than a so-called 'Micky Mouse Degree'. This phrase was first used in 2003 by Margaret Hodge as part of a discussion paper on the expansion of Higher Education, who was the UK Minister of State for Universities (11 June 2001–2013 June 2003) [9]. Hodge referred to a Micky Mouse degree course as one 'where the content is not as rigorous as one would expect, and where the degree itself does not have huge relevance in the labour market, and that simply stacking up numbers on Mickey Mouse courses is not acceptable'.

In respect of this statement, there is a fundamental moral issue to be considered in association with ethics in educational provision. This is whether it is ethical to treat young and vulnerable people in this way and in effect, use their basic naivety to extract money out of them before they have had a chance of earning a living. Moreover, what value can such graduates have in the development of a knowledge-based economy.

It is quite literally a waste of a generation, prohibiting the contributions that they could make to society and thereby creating a future for themselves and their children. It would appear that the original drive in the 1990s to get more school leavers to pursue a university education in order to soak up youth unemployment has only made the situation worse. Instead of having a generation of unemployed school leavers, we now have a generation of unemployed university graduates burdened with debt. This is a situation that can no longer be tolerated and 'Britain's great university scam can't be allowed to destroy another generation' [10]. However, it s a situation that is not new, and has a synergy with the state that the UK found itself in during the 1870's due to the 'Bismarck effect' as shall now be explained in the following section.

4. The Bismarck effect

In the mid-Nineteenth Century, the British Empire was at its zenith, and it started to focus on consolidating its trading dominance. In addition to basic schooling, its educational provision was based on two principal categories: (i) 'Public Schools' which were then as now, very private and fee-paying institutions, and focused on educating an elite for the governance of a worldwide trading empire; (ii) technical institutes whose purpose was to maintain the industrial infrastructure of, what at the time was the 'workshop of the world'.

In the 1870's, two major industrial competitors of the UK came to fruition in the form of the United States of America and the new German state which was proclaimed on 18 January, 1871. The latter case was a direct consequence of the considerable political competence of Otto von Bismarck who was the first Chancellor of Germany until 1890, specifically Minister President of Prussia from 9 November 1873 to 20 March 1890 [11].

Both the USA and Germany introduced educational initiatives to promote the rapid the development of science, engineering and technology in order to support industries aimed at driving the prosperity of the new nation states. However, there was a significant difference in the approach taken. Developments in the USA were primarily driven, then as now, by entrepreneurship and private enterprise. This led to a considerable stream of inventions and business innovations that have dominated the world ever since. Examples include the inventive genius of Thomas Edison and Nikola Tesla, for example. The development of early telecommunications by Alexander Bell,

and the creation of the automotive industry by business icons such as Henry Ford. However, in Germany, industrialisation was organised and controlled more fully by central government. This was primarily based, then as now, in Westphalia and Lower Saxony which are areas of Germany able to provide that natural resources for the production of steel, a material that at the time, was the mark of an industrial nation state.

The German unification strategy that Bismarck created and implemented, led to the new country flourishing in the arts and sciences, in engineering and technology, and especially, in chemical engineering. Consequently, Germany started to be transformed into a major industrial competitor and economic power. This transformation was served by a progressive written constitution and driven by a state education system with a broad curriculum, coupled with a social welfare provision that was decades ahead of the UK for the time. Bismarck was in fact the first to establish a welfare state in a modern industrial society with the social welfare legislation of 1883 [12].

All this German activity disturbed the status quo of the British establishment for similar reasons to those associated with the current emergence of China, which is disturbing the balance of an assumed normality dominated by the USA today. It led to the 'Great Depression' of the 1870's which severely compromised the dominance of the UK, and caused many British engineers to seek employment and adventure overseas. Something had to be done. What was done is discussed in the following section.

5. British response to the German Tiger

In a letter written on 12 June, 1899, from Queen Victoria to her eldest grandson, William the Second, Emperor of the German Empire - the Second Reich - she states the following: 'I never personally attacked or complained about prince Bismarck, though I knew well what a bitter enemy he was to England and all the harm he did' [13].

Why should, in a purely political sense, Victoria call Bismarck a 'bitter enemy of England'? After all, Bismarck was a great admirer of England, he spoke fluent English, and was a scholar of the works of Francis Bacon and William Shakespeare, for example. It is because Bismarck represented a disturbance to the British comfort zone of the time, which always occurs with the emergence of a new order, especially when that order is based on competence.

Victoria's letter was representative of the British establishment's attitude to Bismarck, one that was essentially predicated on a mixture of arrogance, Margaret Thatcher's definition of socialism, and above all, fear. In order to help compete with the emerging 'German Tiger', and indirectly control it, the British establishment encouraged Queen Victoria's eldest grandson to oust Bismarck. This he did successfully on 18 March, 1819, when Bismarck was forced to resign by the Kaiser. This was a very big mistake. Replacing a progressive social and political genius such as Bismarck with a traumatised Kaiser, just because he was a member of the European club of unelected heads of state, may have cost the lives of millions in the century to come. Think how much richer the curriculum of our educational establishments might be today, had this blatant interference in the affairs of others, not taken place.

There was, however, another thing that the British establishment did, which was an important and a very necessary initiative, and a direct reaction to the 'Bismarck

effect'. This involved the establishment of brand new centres for technical training which focused on apprenticeships and work-place based learning schemes to help in the reformation on industrial practices and manufacturing industries through Britain and its empire. This reaction to the 'Bismarck effect' started in the early 1870's, after the unification of Germany. One of the most iconic of these new training centres was the Central Institute of the City and Guilds of London [14]. Based in South Kensington, London, this institute is now known as Imperial College. It is one of the premier scientific, technical and research establishments in the world, equal, if not greater in stature, to more traditional UK universities such as the universities of Oxford or Cambridge, at least in terms of science and technology.

Imperial College has an interesting history, in that after developing its technical training services as a City and Guilds centre, it joined London University in 1908, only to leave the university in October 2006. One of the underlying reasons for leaving, was that it wanted to go back to its City and Guilds roots. And it is these roots, that many UK higher education institutes are now destined to grow from, lest they deprive themselves and their graduates of a future. This is because the Imperial College Model is the embodiment of a Knowledge-based Economy compounded in the 'Triple Helix Concept'.

6. Knowledge economies - the triple helix concept

The Triple Helix Concept 'considers the interaction between university, industry, and government to be the key to innovation and growth in a knowledge-based economy' [2]. While the phrase 'Triple Helix Concept' is relatively new, the basic idea that it proposes is not.

One of the current underlying problems with the concept, or at least its implementation, relates to the post 1945 legacy of UK based education. This is reflected in the continued debates undertaken by the executives of universities in regard to change management, and their failure to comprehend an underlying reality, which is that the majority of university academics are not fit for purpose in regard to appreciating, let alone endorsing the Triple Helix Concept, [15, 16]. But they could be, especially if they could learn to respect it rather than fear it, and, because of their fear, hold it in contempt. This problem would quite naturally become null and void if university academics had to have experience in industry for them to be appointed to an academic position in the first place. Such a realisation can make important impacts on society, above and beyond the cloisters of the 'Ivory Tower'.

For example, in the 1920's, and, working with his former PhD student, Leo Szilard, Albert Einstein became involved in a business venture; essentially a spin-off company from Berlin University where he was working at the time. The focus of the business was to design more efficient and safer refrigerators. The business venture actually failed because of the effects of the Wall Street crash of 1929. Nevertheless, in addition to numerous patents, the nature the business, at least in terms of some of the more abstract thinking required, led to a solution to the so-called 'Maxwell paradox' in thermodynamics.

This solution was published by Szilard in 1929 in the Zeitschrift fur Physik, with a seminal paper entitled, 'On the Decrease in Entropy of a Thermodynamic System by the Intervention of Intelligent Beings' [17]. The paper is one of the most important in the history of physics, and is absolutely fundamental to the digital communications

world we live and work in today. This is because it was the very first publication to introduce the idea of Information Entropy, which is usually, but incorrectly, attributed to the American Mathematician and Cryptographer, Claude Shannon, who rediscovered it in 1948 [18]. Information Entropy is the key for estimating the minimum number of bits needed to encode a string of symbols, and therefore represents a fundamental limit as to how much information is communicable digitally in terms of a sequence of bits.

Thus, an idea that is so fundamental to our society today, and possibly the physics of tomorrow, was originally conceived through the juxtaposition of an enquiry conducted by academics in regard to an industrial problem. It is an example that lies at the heart of the Triple Helix Concept.

In this respect, just as the British government was forced to change things and develop a new infrastructure for technical training in the 1880's (as discussed earlier), history is now repeating itself, in order for the UK to comply with trends taking place overseas such as in China, for example. China has a growing technical dominance which was arguably catalysed by Deng Xiaoping, when he stated that, 'it doesn't matter whether a cat is black or white, as long as it can catch a mouse' - preferably a mouse with more than a Micky Mouse degree! In this context, there is a close synergy between the development of China now and the development of England in the 17th Century. This is explored in the following section.

7. The English reformation: a revolution in education

'I beseech you, …think it possible you may be mistaken'. So said Oliver Cromwell, one of England's most enigmatic but influential politicians. This is a statement that we should endeavour never to forget, because it provides an intrinsic resistance to the faults that pervade society, encapsulated in the 'Four Idols' of Francis Bacon, as briefly discussed earlier. Cromwell's influence and legacy is well known. However, given the remit of this material, there is an aspect of his contributions that is not as well appreciated as it should be. It is for this reason, that Cromwell's contributions to English education is now briefly addressed.

After the end of the English civil wars of the 1640's, there was continual debate on precisely how the three kingdoms of England, Scotland, and Ireland should be governed and developed in line with values that reflected the Realpolitik of the new republic. To this end, a 'Rump' Parliament was established after the conclusion of the war in September 1651. Mismanagement and corruption led to this Parliament being forcibly dissolved by Oliver Cromwell in 1653 [19]. Cromwell was declared Lord Protector in December 1653, a position that he retained up until his death on 3 September, 1658, [20].

The changes that Cromwell made in the five years he exercised full power were radical in the extreme and included a focus on the educational traditions of the time. For this was a period of disruptive thinking which inspired the development of new ideas in regard to civil order, philosophy, science and the nature of society and its prosperity. And much of the scientific and philosophical thinking was predicated on the ideas and principles conceived by Francis Bacon in the early part of that century. It is in this respect, that the most important and long-lasting effect of these times was the renaissance in English education that occurred [21].

While there were many different reasons for this renaissance (which historians continue to debate), given the social conditions of the time, it is arguable that the most

important reason was that for the very first time since the fall of the Roman empire some 1000 years earlier, education passed, in every way, from the church to the state. This is because calls for educational reform were being inspired by a desire to improve the lot of the poor, many of whom had suffered significant deprivation in the economic depressions of the 1630's. In fact, it was these economic circumstances that had contributed to the outbreak of the civil wars in the decade to follow, a fact that is a common theme throughout the history of armed conflict.

The Puritans called for a broad range of reforms including the provision of technological and agricultural education, a system of schools to educate all children, and more financial aid for deserving students. These reforms were of significant value as a means to better the status of the working classes.

This occurred at a time when England needed to find solutions to its critical financial situation; a very common theme that occurs when any society uses its treasury to finance an armed conflict. It is in this context that the Commonwealth of the 1650's embarked on the development of new wealth creation activities through international commerce. To do this, the Commonwealth needed to re-engineer its education system, focusing on a curriculum underpinned the promote of trade and industry. This is a situation that is not entirely dissimilar to the situation that the UK finds itself in now, following 'Brexit day' on 31 January 2020, when the UK ceased to be a member state of the European Union. In this context, Cromwell's government actively encouraged the immigration of well-educated and skilled foreign nationals, just as the UK is doing today. In the 1650's, this also included the 'readmission' of the Jews to England [22, 23].

Before the 1650's, the English education establishment was a very insular and parochial enterprise. Consequently, Cromwell introduced a comprehensive range of new Schools, Colleges and Academies in which the Sciences, Technology, Engineering and Mathematics took a precedent. This was perceived as a form of subversive criticism, causing offence to the academic establishment of the time, [21].

The perceptions of the academic establishment were indeed quite correct. In respect to the economic position that England found itself in after the civil wars, Cromwell and his government were not at all satisfied with the education system that the new republic had inherited. As is the case today, English education was a reflection that was well encapsulated in one of Bacon's 'Four Idols', in particular, his 'Idola Specus' or 'Idol of the Cave' as discussed earlier. In this respect, the universities of today have become similar 'Idols' through their focus on political correctness, and the near complete irrelevance (with regard to the job market) of the curriculum that is being taught, coupled with their fear of open debate and those that dare to disturb the mediocrity of the norm.

Cromwell's educational philosophy was predicated on the philosophy of Francis Bacon. He wanted the education system in England and the Commonwealth to be transformed into one that promoted the drive for reason, literacy, science and industry. For school leavers and university graduates to be trained in agricultural practices, in ship building and the 'art' of navigation as it was then. To be proficient in mathematics and scientific philosophy, focusing on experimental verification, as well as being trained for entry into the New Model Army and Navy. In this context, Cromwell promoted many of the Guilds to enhance training in practical skills and craftsmanship and provided increasing levels of finance to help increase the number of apprenticeships.

While Cromwell and his government could not have imaged the effects of his educational reforms on the future prosperity of the land, one can observe a clear

correlation between the radical changes that were introduced in the 1650's and what later came to be known as the industrial revolution in England. Soon after Cromwell's death, his monarchist successor, Charles Stuart the Second, established many great scientific institutions such as the Royal Society which promoted an approach to education, science and literacy that Cromwell had inspired during his short role as King Oliver in all but name. Thus, the worlds first industrial revolution was in fact seeded by a vision for English education based on the scientific philosophy of Francis Bacon. It took a civil war and a new English republic to convert this philosophy into a practically realisable education system that went on to radically change Europe and the world beyond.

In a Nutshell, what Cromwell did was to drain the 'Whitehall swamp' of his time and oxygenated the pond. And the better part of this oxygenation was the education of the land; and in his time, and, for that period of history, that land was England. The most important and relevant thing to understand is Cromwell's strategy, which was not to confront but to by-pass the academic establishment. This is precisely what is going on now.

Before the English civil wars of the 1640's, England was still a relatively minor player in European affairs. It had nurtured a relatively small handful of scholars, philosophers and intellectuals that could rank with those littered throughout renaissance Europe at the time, most of whom had been educated in various European universities. However, after the civil wars, and within some 100 years of Cromwell's death, the number of English and later, Scottish born individuals, contributing to the revolutions in science, technology, and engineering grew rapidly, their contribution helping to forge the world in later centuries.

Examples of such individuals are too numerous to name, but Isaac Newton must surely rank as one of the most famous and influential who has a special place in the list of contributors to the scientific revolutions taking place at the time. Moreover, in the context of changes taking place throughout Europe in the 17th Century when new ideas were being actively encouraged to flourish in the north of Europe compared to the south, it is an irony that Isaac Newton was born on Christmas day, 1642. For this was the same day that the great Italian scientist, Galileo Galilei, died. And it was Galileo, who, after being treated so badly by his church, and placed under house arrest, that had predicted the transition that would taking place in Europe after his death.

One of the reasons for this can be directly attributed to Cromwell's investiture in apprenticeships, work-place based learning and technical education [19]. It is therefore interesting to note, that this is precisely the policy that is now being pursued by the UK government. Thus, in the following section, two case studies are considered that are indicative of the future of higher education, compounded in the new age of the Technological College. They are examples of the current government's strategy, not to confront universities for what they have become, but to bypass them, and fund a new approach to Higher Education just as Oliver Cromwell did in his time.

8. New age of the technological college: Some example case studies

One of the principal goals for HE in the UK, at least in the short term, is to eradicate 'Micky Mouse Degrees'. The approach to doing this will usher in a new age of the Technological College. The emergence of such colleges is illustrative of the realisation that a university degree is not the only route to success. This is

compounded in the relatively recent announcements of plans to reform post-16 education in the UK. This is in order to give employers the skilled workforce that is now needed [24] and follows the UK government's 2019 landmark review of HE [25].

8.1 The Ada National College for digital skills

In 2014, Microsoft identified the order of 100,000 technical, programming and Information and Communications Technology (ICT) related jobs in the UK that could not be filled for lack of appropriate skills of UK graduates. This was a particular embarrassment to the UK government at that time, but it should not have come as a surprise, given the approach that has and continues to betaken by the UK university sector. As a result of Microsoft's identification, in December 2014, Prime Minister David Cameron announced the establishment of the first new college of its type since 1993. The Ada National College for Digital Skills [26] in London first opened its doors in September 2016 with the following mission statement: 'The mission of the College is to work with industry to design and deliver an institution that provides the education and support needed for all its students to progress into highly skilled, computing related roles'. The focus of this college is to provide its students with the hands-on skills required to enter the digital technologies job market.

The learning providers that work with the National College for Digital Skills are not 'academics' in the traditional university context of the word. Rather, they are industry-based experts with a wealth of practical experience in digital technologies. This ranges from basic computer programming skills to current advances in Artificial Intelligence. The college represents an example of an approach to post-16 education and training that provides an essential contribution to filling the job roles of the future associated with the so-called 'Big-data Society'.

The industries for which this approach to education has become necessary are those that are driving progress in communications infrastructure, for example, in data management and security, and financial management. Other example, include new generation health care technologies and personalised medicine, renewable energy, and public health management. These are the subject areas that are expanding rapidly in UK. The problem is that there are currently not enough properly trained graduates to enter this job market. And yet, it is this job market that is going to be vital for developing a knowledge-based economy for which the goals of education are now being directed.

8.2 The Institute of Digital Technology at Bletchley Park

Another example of the new age of the technological college is the Institute of Digital Technology at Bletchley Park which opened its doors, as of September 2021 [27]. As with the Ada National College for Digital Skills discussed previously, the aim of this College is to focus on developing the hands-on programming and technical skills required by industry. This is achieved by the College working with the relevant industries and associated professional institutes. In this way, teaching modules and units are designed with a relevant workplace-based curriculum.

The materials are typically presented by industry based teaching consultants who are also responsible for tutoring students, i.e. learners that have typically gained apprenticeships through the earn as you learn schemes. In this way, the institute does not impose what it wants to teach as in a university. Instead, the institute enquires into want apprentices need to know to undertake their job and to develop their career. Consultants are then approached to provided the teaching and learning programmes

that are required, consultants that are experienced in the very same industries to which the apprentices are assigned and have typically been apprentices themselves.

The Institute of Digital Technology is another example that reflects the UK government's drive to by-pass the traditional university sector in terms of focus and funding. In this case, the aim of the College is to reflect the work undertaken at Bletchley Park during the Second World War. This is when mathematicians, scientists and engineers developed the bedrock of the ICT revolution. For it was at Bletchley Park that the world's very first partially programmable computer - the *Colossus* - was designed, built, and operated. This was achieved through the technical knowledge of a City and Guild apprentice called Thomas Flowers, and not just the theoretical ideas of Cambridge graduate Alan Turing, who had previously helped to improve upon the Enigma decryption techniques developed in Poland during the 1930's. A fact that is illustrative of, and a testament to, a reality in which theoretical ideas are always strengthened by a respect of complementary technical skills.

The Institute of Digital Technology does not of course want to inhibit its customers from contributing the originality of Alan Turing. But its principal aim is to provide the technical excellence required by a society that has evolved to become reliant on the legacies of both Alan Turing and Thomas Flowers. The work undertaken at Bletchley Park during the Second World War is illustrative of the fact that both university and vocational qualifications are important and must be respected in equal measure, lest the distinctions between a university graduate and an apprentice become poisoned through a clash between fantasy and reality, respectively.

9. Further examples of new initiatives in higher education

In addition to the new age of the technological college that is emerging, there are many other industry-based and government initiatives that are now taking place. Some examples of these are now considered.

One of Prime Minister Tony Blair's greatest ambitions was for 50% of school leavers to study at university, a feat that he and his successors took some 20 years to achieve. That is now changing because of the entrepreneurial efforts of industry. This includes, rather ironically, Tony Blair's eldest son, Euan Blair, who recently announced that his education start-up company called Multiverse, established in 2016, is being designed to divert school leavers away from university into apprenticeships [28]. The company was recently capitalised with funds that are being diverted away from the university sector.

Another example is the recent pledge made by IBM to give '30 million people worldwide new technology-based skills by 2030 through local partnerships with education providers, government departments, and other organisations across 30 countries'. It is a bid to 'ensure that people of all ages have the skills needed for future roles. IBM will use both new and existing programmes alongside partner organisations to teach people a variety of technical and workplace-ready skills' [29].

This is just one of many examples, where industry is taking the lead to fill the gap between the stuff being taught at universities, and the skills needed for the workplace. With technology advancing and becoming increasingly embedded into so many parts of life, it is important that everyone is given the skills they need to navigate the digital world. This is a case of history repeating itself as IBM introduced a large-scale UK graduate re-training program established in the 1980's in order to feed the City of London with the IT expertise that it was so badly lacking at the time. The emphasis was to fast-track graduates in the 'art' of computer programming and software

engineering using a number or IBM associated trainers and an even larger complement of staff whose sole aim was to secure employment for the re-trainees.

It is in this context that the UK government is finally acting through their current 'Skills and Post-16 Education Bill' [30]. Sponsored by the Department of Education and originating from the House of Lords, the Bill is now progressing through the House of Commons. It is a Bill to make provision about local skills improvement plans relating to further education; to make provision about functions of the Institute for Apprenticeships and technical education qualifications; to consider student finance and fees and assessments by the Office for Students, and to make provision about the funding of certain post-16 education training providers. In short, it is about making provisions to counteract the effects brought about by the irresponsibility of the university sector.

10. The cause of the problem

How did UK education ever get into the state that it now is? Blaming governments, teachers and academics for the current state of education is all too easy. The material presented in this chapter is not about blame but understanding. So how can we understand what has happened? It has much to do with the changes that have taken place over the past thirty years - and very positive changes at that. These include the fall of the Berlin Wall in 1989 which was the icon for the collapse of the communist systems in Eastern Europe and the Soviet Union. The reasons for why this occurred are numerous. However, a very important reason, is a consequence of the educational provision that the communist system developed. For it produced a most remarkable transformation of society in terms of the literacy and numeracy of countless millions. Perhaps it is because of this, that the system imploded as it did. In other words, the focus on high-quality technical education that the communists coveted was perhaps the very thing that brought it all down upon their totalitarian heads.

As always, there is a price to pay even in victory. The price that the UK is now paying is a result of dismantling much of the scientific civil service and industries that were designed to maintain the status quo during the cold war. The direction of our education system has followed this understandable response to the end of that war. And besides, if high quality technical education was a reason, or even the reason, for the collapse of a system that had introduced it, would it not be sensible to compensate for such a causal incident and accommodate accordingly.

This is not of course to suggest that there is some secret think tank in Whitehall whose advice to governments has been to keep young people dumb and in debt so that they can be controlled, thereby staving off the embarrassment the Kremlin suffered in 1989. This has occurred quite organically. But in response to this occurrence, it may be that certain nation states who see fit to educate their children properly in STEM, and are consequently experiencing considerable economic growth, may have come to understand that it is in their best interests that certain other nation states are encouraged to carry on just the way they have been.

11. Concluding remarks

The current and growing problems associated with the UK Higher Education system is reflected in the numerous and detrimental statements being made by government and industry. This is compounded in what employers are constantly saying in regard to UK university graduates, namely, that 'while the cost of education to both

the state and students alike is growing, graduates are increasingly unprepared for the workplace' [30]. In this context, parents and schools alike are starting to encourage school leavers to enter the 'University of Life' through earn as you learn apprenticeships. This is an approach that should be nurtured on the basis of the following points:

i. An increasing number of universities universities are offering fast-track one- or two-year degree programs, predicated on an increasing recognition of and respect for a National Vocational Qualification awarded by a professional body through a technological college.

ii. These fast-track degree programs are being integrated into online learning schemes that can be undertaken in a full- or part-time mode, and as a set of short-courses, a training mode that is consistent with nature of continual professional development.

iii. The traditional lack of parity of esteem between vocational and university educational pathways is being dissipated and increasingly irrelevent.

In terms of point (ii), the recent Covid-19 pandemic has forced the issue, and shown that this mode of teaching is not only possible but desirable, at least in terms of cost benefits. However, it is the third point that is the more difficult issue to resolve as it represents a deeply embedded social reality in the UK. As a result, the middle classes continue to do their children the disservice of limiting their future prosperity by being sucker to educational values that have passed their sell-by date.

Perhaps they should be encouraged to do so? This is because it will provide a new window of opportunity for the coming technically competent proletariat to influence the future prosperity of the state. It will be predicated on training provided by industry experts rather than tenured academic staff, whose mentality was moulded by a society of excess that no longer exists. And this is why more and more state funding will continue to be channelled into the development of the new technological colleges, just as it was in the 1650s, and again, in the 1880's (as discussed earlier); a case of history repeating itself in order to provide similar solutions to very similar problems.

This is reflected in the numerous, publications, reports and commentaries throughout the education sector and from professional bodies, especially in engineering. It is now clear, that while education, training, and continuous professional development are the answers to many problems facing engineering, new ways of learning are required that transcend the traditional university sector. It is accepted that while this transition will not be easy, it is absolutely necessary [31].

12. Some final thoughts: an educational philosophy for the future

As stated in the introduction to this chapter, in 1609, Francis Bacon wrote a book on the 'Wisdom of the Ancients' a wisdom for which he had great respect. In this regard, and that of educational provision in its broadest spectrum, it is of interest to contemplate the following: If education based on the wisdom of the ancients, had not been interrupted for the best part of 1000 years between the fall of the Roman empire in 5th Century and its re-birth in the 15th Century, then how much more advanced might humanity be today? And if this educational provision had occurred, would humanity now be in the position that it now is; where, for the first time in its history,

it is having to contemplate the clear and present danger that exists due to the damage being done to our planet, for which humanity has only itself to blame.

In his book 'The Greek View of Life' [32], Goldsworthy Lowes Dickinson writes the following: 'With Greek civilisation beauty perished from the world. Never again has it been possible for us to believe that harmony is the truth of all existence'. It is in this context that Dickinson, dismayed by the First World War, evolved the idea of a League of Nations, his subsequent writings helping to shape public opinion towards the creation of a League of Nations, the ancestor of today's United Nations.

An icon of the Greek view of life is Athena, illuminating humanity through her quest for reason, understanding, compassion, and tolerance. This icon symbolises the primary transformation of society that is taking place in our time and will be judged as such in the future; where humanity is reaching out to the Greek view of life.

Since the Fifteen Century, Hellenism has been steadily re-emerging from the dark ages. Examples include the English Civil War discussed earlier, and the French, American and Russian revolutions. And in our times, the fall of the Berlin wall, the abolition of Apartheid, and the ongoing civil rights movements, for example. But the most important movement of all, is reflected in the recent United Nations Climate Change Conference. This is because the effects of climate change are not going to care about our trivial differences and petty disputes or our parochial identity politics. And there will be no compensation culture available to rectify the damage handed down to future generations if we do not reduce the Carbon emissions of today for the sake of tomorrow.

Some 2000 years ago, in his book 'Meditations' [33], the Hellenist Roman emperor and philosopher, Marcus Aurelius Antoninus, wrote the following: 'When you arise in the morning, think of what a precious privilege it is to be alive - to breathe, to think, to enjoy, to love'. In this context, it should be understood, that our current behaviour is digging the graves of those yet to be given the privilege of being alive. If we want to provide future generations with this privilege, then we must go back to the wisdom of ancients, embrace the Greek view of life and educate our children accordingly, lest they fail to understand the words of the great Athenian philosopher, Socrates [34]: 'There is only one good, knowledge, and only one evil, ignorance'. In this way, those who might weigh us in the balance, many years from now, may be grateful to us for providing them with a wisdom that flows from the Greek view of life, a life that forged the greatest empire of all, an empire of the mind [35].

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