

FUTURE SKILLS: DEVELOPING SKILLS FOR JOBS THAT DO NOT YET EXIST IN SECTORS THAT HAVE NOT YET BEEN INVENTED

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ABSTRACT

*In this paper, the author reconsiders the question of whether compulsory education systems are 'fit for purpose', when the purpose is to provide adequately educated people with the Knowledge, Skills, and Attributes (KSAs) that allow them to be useful and productive members of society. By the use of structural unemployment rates, the author shows that even though the populations were increasing, unemployment remained the same over a long period suggesting that the right KSAs were being provided. The author then considers the changes to compulsory education that occurred in the last two decades of the 20th century in medium and high-income societies, and how this has, potentially, broken the link between the KSAs provided and the KSAs needed. He ends with a call for action to rethink the provision of tertiary education so as to ensure those experiencing it are fitted with the skills needed for the future. This paper was delivered as the keynote opening speech at the iCiTRA conference in Malaysia in September 2021, the text itself is taken from the author's 2017 paper *Unfit for Purpose? Graduate business education and the real world: a reflective and evidence-based discussion about education, jobs and unemployment*.*

Keywords: Fit for purpose; Compulsory education systems; KSAs

INTRODUCTION

A rather cursory review of history shows that all education systems are founded on the requirement to provide the skills and knowledge needed to allow individuals to be integrated, effective and productive members of society. Initially, this was so that a small number of males were able to work as functionaries within the state or legal apparatus and/or in the approved religion of the state, whilst the rest were involved in agricultural activity the knowledge and skills for which were learned 'on the job'. To all intents and purposes, females were excluded from all formal educational activities. This situation did not change substantially until societies moved from agriculture to manufacturing, from subsistence markets to commercial retailing, from economic isolation to international trade, and from rural existence to urbanised populations.

Of course, societies evolved at different rates and at different times, but the evolution of education from educating the elites to compulsory education for all, and its correlation with the industrialisation process, is most clearly demonstrated in Europe from the 1740s to the modern day.

Using the United Kingdom as a case study, the rise of compulsory education correlates to the changes that occurred during the industrial revolution, which swept across Europe and the rest of the world in the 19th century. From earliest times to the late 18th century, the main work in the economy was labouring, with the majority of that in the agricultural sector. There were, of course, craftsmen, with two dominant sectors: building and metalworking. All work was repetitive and, more than anything else, required manual skills and physical strength, with any theoretical knowledge passing from ‘master’ to ‘apprentice’. There was no need for a more formal and theoretical education and certainly very little need to be able to read or write, the experience of the repetitious nature of the work filling any knowledge deficiency. There were, of course, some occupations, such as the law and the religion, that required both the cognitive skills of reading and writing, as well as a retained knowledge of the specific subject matter. But in truth, there was no necessity for a formal education system with widespread school attendance to prepare the population to be able to be useful and productive members of society – and being useful and productive members of society was what was required: these were the Intended Outcomes for the entire education system at the time.

The first signs of a shift appeared in the European ‘age of revolution’ (1740-1840). Major upheavals in social and economic life were based on transmitted knowledge through the written word, but the vast majority of the populations of the United Kingdom, North America and continental Europe still had little or no requirement to even read or write, and even less to be able to do more than very basic arithmetic. Even with the coming of the ‘industrial revolution’, very little changed in terms of the need for a more formalised knowledge-based education system, although by this time a growing number of people had learned to read and write and do arithmetic at a basic level. This was, however, soon to change as a result of the philosophical shifts that arose out of the ‘age of enlightenment’: by 1870 the government of the United Kingdom had decided that a more educated population would be more economically productive so they introduced compulsory education for both males and females up to the age of 10 years.

The late 18th and the whole of the 19th century saw the first wave of globalisation as the major western world powers, led by the United Kingdom, the Netherlands and France, colonised or established bases around the world in the name of ‘trade’. This brought with it a growing demand for educated individuals to run this developing globalised trading environment. By 1899, compulsory schooling in the United Kingdom covered the ages of 6-13 years and a similar pattern was emerging in the United States of America and across continental Europe. In all cases, the focus of the schooling was on reading, writing, arithmetic, basic history and geography, the ‘classics’ of ancient Greek and Roman history, an orthodox knowledge of religion, and the rudiments of trade. For boys, there was also the apprentice-based system of learning craft skills related to making goods, and a few were lucky enough to be introduced to science and engineering which were then at an early stage of development. Girls studied music, art, and domestic subjects as education was very gender-biased.

The late 19th century also saw the exponential growth of intellectual development that soon demanded even better educated individuals, mainly men, but despite this surge in intellectual advancement, nothing much changed for the vast majority of the population who remained engaged in economic activity for which little more than the compulsory schooling was needed.

In reality, this situation did not change significantly until 1940, when, as the author explained in a January 2017 essay (White 2017),

“... World War II massively increased the demand for production of war materials, to an extent that created an imbalance between supply and demand of labour and production capacity. The problem was resolved by the development of production techniques through the introduction of mechanisation but there was still little need for a more skilled or a more knowledgeable workforce. Even the shift in the 1950s to a consumerist economic model and the diversification away from large-scale goods towards small consumer goods did little to change the nature of the work being done: the majority was still labouring and doing craftwork, although increasing mechanisation was moving some sectors into a technical work categorisation.” (White 2017).

By this stage, the majority of work, although still labouring, was thought to require a more advanced level of education and in 1944, the school leaving age was raised to 15; then in 1972 it was raised further to 16 and in many countries, it has now been increased to 18 years. But other factors came into play: the declining birth rate and the increase in net immigration. The immigrants who had arrived over the previous 50 years had generally taken over the low-skilled jobs that the now increasingly wealthy British, with their sense of being entitled to a good job, had refused to do. This could have resulted in a rise in unemployment amongst the British but it appears that a corresponding growth in middle-skilled jobs absorbed this. Thus, the evolving compulsory schooling curriculum was still effective.

What the children learned had advanced with the inclusion of a more detailed science curriculum, more advanced mathematics, and a range of arts subjects. Whichever way this is regarded, in terms of public policy the child was still deemed to have obtained the necessary knowledge and cognitive skills to be a useful and productive member of society by the time they were 16-18 years old. This is born out by looking at the national unemployment levels in the UK, which, according to Denman and McDonald (1995) remained steady at around 5.4% for the 100-year period 1881-1980. It seems reasonable to assume, therefore, that the number of jobs in the economy grew to match the number of people in the workforce, and from this it also seems reasonable to conclude that for this ‘full employment’ to exist the workforce must have had the requisite Knowledge, Skills and Attributes (KSAs) for the jobs. From this it is also reasonable to infer that the compulsory education system had been equipping those entering the workforce with the right KSAs, thus it was ‘fit for purpose’ in that it fulfilled its primary objective, its Intended Outcome, of educating the population to be useful and economically productive members of society.

BUT IS THIS TRUE IN 2021?

That depends on how you look at the current state of the world. With the introduction in the 1990s of ‘disruptive technologies’ based on easily available computing, data analysis, communications and the internet, we see a major shift occurring in the basis of socio-economic models. Much of the world has now moved from the heavily labour-intensive production of primary goods and manufacturing to either a technological/robotic manufacturing process or a service-type economy and in neither case is there a demand for brute strength or massive labour forces. This has freed up labour to work in other sectors that rely more on the application of knowledge and the skills to apply it. But it would, the author contends, be wrong to assume that the much talked about move to a knowledge-based society has actually happened anywhere. Why is this?

Well, it is, in the author's opinion, because we are now limited and constrained by the normative and historically based nature of the education systems. We are still teaching knowledge and skills that were appropriate for the pre-1990s (but were pretty much out of date even then) and we have been caught unawares by the changing world of work. The current pandemic has made this even more evident: offices are empty, people are furloughed or working from home, and yet the world economy, after the initial decline, is powering along nicely. But are we teaching our students how to be effective and productive in this type of environment? Indeed, is this still the Intended Outcome of the education system?

THERE IS OVER-CAPACITY IN TERTIARY EDUCATION

Before the 1980s, there were just 38 universities in the United Kingdom providing tertiary education (undergraduate to post-graduate) and for 30 years from the end of World War II an average of just under 10% of the 18-21 age cohort had each year stepped beyond the compulsory schooling system to engage in more advanced study (Maitlis 1998). The courses offered were sharply focused on single subjects and those receiving their Bachelor's degree after three years generally ended up fully employed. At the time, less than 10% of undergraduates went on to study for a Master's degree and less than 10% of graduates then went on to study for a Doctorate (i.e. only 1% of the 18-21 age cohort studied for a Master's degree and only 0.1% of the cohort studied for a Doctorate).

By the 1990s, the neoliberal, free market economics paradigm had wrought a major change in the KSAs needed and the government had acknowledged the need for a more advanced level of education in the work force – a level that could not be delivered in the compulsory schooling arena with its focus on cognitive skills and a not very advanced knowledge. What the UK needed, said the government experts, was to become a 'knowledge economy' with advanced knowledge – specifically advanced knowledge in the STEM subjects (science, technology, engineering and mathematics).

In 2005, the UK government decided to go one step further and immediately set the target of having 50% of the 18-21 age cohort in tertiary education. This was an extraordinary target as it demanded that undergraduate numbers should grow from 44,000 to 283,000, a growth of 640%. But numbers were approaching this by 2006 and an average of 45% participation was recorded by the UK's Department of Education (Office of National Statistics). Somewhat naturally this put enormous strain on the tertiary education institutions, a strain that resulted in a massive building programme and, in terms of academic standards, a regression towards a mean that was little beyond the standard of a first-year undergraduate programme. This seems to have had the result of the Master's degree replacing the Bachelor's degree as the 'entry level' qualification for a mid-level or high-skill job. And although the total number of undergraduates starting a Master's degree has increased, the percentage has remained constant at around 9-10% of the age cohort.

About the only real results of all this transformational change appears to be under-utilised university buildings, a decrease in the number of 18-21 years old entering the workforce, and the perception of a worrying decline in academic standards. And then there is the stratospheric rise in subjects that are not related to being effective and productive members of society but rather are focused on 'allowing the students to develop as individuals' with subjects that have very little

benefit to society even if they help students while away three to five years as an economic drain on society (and just in case some readers may think that the author ‘has it in’ for liberal studies, he teaches courses in anthropology, history, and creative writing as well as cultural studies, behavioural economics, and management).

Education, being normative in its approach and historical in its reference points, assumes that the future will be an extension of and built upon the present and the past. However, automation, the speed of development of digitalisation and, in particular, the growth in Artificial Intelligence, has changed the basis of the economic and political paradigms, to the extent that by the time a student has completed his or her secondary and tertiary education, the world of work that they will enter will have changed dramatically and much of what they had learned may no longer be valid or applicable. Indeed, the jobs that were available when they entered the education cycle will probably no longer exist and new jobs will have been invented in sectors not yet thought of. This presents the entire global education system with the most significant challenge it has faced in the last 100 years: what should we teach students to prepare them for the fast-changing future – in other words, how can we make tertiary education fit for purpose?

The author offers the following ideas as the foundation of a coordinated tertiary educational curriculum – on which subject-specific knowledge can then be added in a project-based or case-based learning structure. These suggestions are sharply focused on application of skills and knowledge and not on the acquisition of knowledge alone, and the author believes that ALL programmes, whatever their field of study – the sciences, the social sciences, liberal studies, etc. – should have these as core subjects.

Behavioural Economics

Classical economics has been conclusively shown to use unrealistic critical assumptions that bear little relationship to the real world. The principal theories and models, such as the ‘efficient markets hypothesis’ and ‘supply-demand equilibrium’, are known to be false and whilst students should be aware of them, they should be encouraged to adopt and use more realistic assumptions and models. Behavioural economics is at the leading edge of current economic thinking, and the work of Kahnemann, Tversky, Thaler, Loewenstein, Simon and others should be at the forefront of modern social, political, and economic thinking.

Communications

All organisations are made up of people and it is essential that students obtain a very high level of efficacy in all types of communication, but especially in written (all forms, including electronically mediated such as social media) and spoken formats. Communications courses should include paralanguage (non-verbal language or body language), interpersonal skills, cross-cultural communications skills, public speaking, and media presentation skills. Communications programmes should also teach academic writing, creative writing and persuasive writing.

Creativity and Innovation

Both creativity and innovation can be taught and the University of Malta's Edward de Bono Institute for the Design and Development of Thinking offers a Master's degree in Creativity and Innovation. As the world adjusts to being networked, it will become essential for all leaders of the future to have well-honed creativity and innovation skills. This will also be important in large organisations which are now recognising the need to become smaller, more agile, and more flexible, and this requires a good deal of creative thinking.

Cultural Effectiveness

National cultural differences are very real and the work of Hofstede, House, and others in this field should be taught at both undergraduate and graduate level. But the area of study must go beyond the simple definitions, and must encompass managing and communicating across cultures and in multi-cultural environments.

Disruptive Technologies

Disruptive technologies include computers, smartphones, apps, artificial intelligence (AI), robotics, and automation in all their embodiments; however, it is unnecessary for students to know more than the basic principles of how they work and how to write code. A course in disruptive technologies should focus on how to use disruptive technologies to enhance efficiency, the customer experience, and the societal model.

Entrepreneurship

For the last five years, the author has asked his students whether they are planning on (1) joining a large established organisation, (2) joining a small entrepreneurial or start-up firm, (3) starting their own business activity, or (4) don't know. Approximately 25% say they plan to join a consultancy or a large existing organisation, 65% say they plan to join a small entrepreneurial organisation or a start-up or start their own business, and 10% generally report not knowing. This suggests that 65% of the author's students require entrepreneurial KSAs in particular – KSAs that focus on how to set up a business, the attitudes needed, as well as the KSAs that are required to run 'your own business', etc.

Finance and Accounting

Although managing the organisation's finances in terms of profit and loss (P&L), capital and cash-flow funding, accounting and taxation are essential to the success of any business, informed opinion is that too much focus has been placed in the past on 'managing the numbers' and satisfying the stock market. And too many people are entering adult life without the basics of budgeting, cashflow, and the raising of capital when needed.

Managing People

The singularly most important resource of any society is its people. To date, managing people has usually been taught as part of the business curriculum and often only at undergraduate level and is thought to be inappropriate at graduate level. This is erroneous thinking. All educational programmes should teach Managing People as a stand-alone course that addresses managing people across cultures, and should provide the student with practical skills as well as theoretical knowledge about the topic.

Strategy

For the last 10-15 years the primary focus of graduate strategic management courses has been the 'positioning school', exemplified by Porter et al. and based on 'competitive advantage'. It often comes as a major surprise to students to discover that, in the real world, there are at least 10 different schools of strategic management thinking, and that each model or school is efficacious and more appropriate in different cultural, psychological or economic circumstances. By being taught only one school of strategic management, the student is sent out into the real world deficient in KSAs on the subject. And this is particularly true of graduates in other disciplines in which 'management' is often a dirty word.

Practical Research

By practical research, the author means the ability to understand and analyse free of biases, using critical thinking and critical theory tools and models, and considering all influences so that the data reveals a true picture of the world. It can be done, it should be done, but all too often research is caught into the narrow-minded pursuit for some esoteric concept that can be statistically validated and is broadly useless to the greater population. This inward-looking research often results in a narrow, perhaps deeper, understanding of the topic without broadening our understanding of its application. It is self-centred (although often fun to do) but is unfit for purpose as far as society and the future goes.

CONCLUSIONS

Earlier the author suggested that '...the educational systems have actually been "fit for purpose" when that purpose is to educate citizens to be useful and economically productive members of society...' and he supported this by using the UK's average structural equilibrium unemployment rate which remained within a narrow band of 5-6% until the 1980s, suggesting that the KSAs learned during compulsory schooling correlated with the KSAs required by employers and so a state of more or less full employment existed. This leads to the conclusion that, from 1880 to 1980, the state-imposed education system was 'fit for purpose'.

But things changed with the introduction, in the 1990s, of 'disruptive technologies'. The changing nature of the work, and thus the changing nature of the KSAs required, resulted many middle-skilled workers no longer having the appropriate KSAs to be employed, and they have

become long-term unemployed. This in itself is not evidence of a failure of the education system per se, as many of those now joining the structurally unemployed were well past the age of compulsory schooling, but it does appear that the tertiary education sector has not been able to adjust and to provide the necessary adult education that was now evidently required.

The tertiary sector's inability to respond fully to the changed KSA demands of the job market is particularly noticeable in that graduates in all fields seem under-skilled and under-prepared for the challenges they face and in this we are to blame. Tertiary educators are sending out students with skills and knowledge that were out of date when the educators acquired them, and they are of little use in a future world. Tertiary educators must ensure that their students, whatever their field of study, are able to function in a world that has yet to be invented.

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