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Is Technology in England different from Technology in Scotland?
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Biographical note
John Dakers is a lecturer in the Department of Educational Studies at the University of Glasgow. He holds particular responsibilities towards delivering the Bachelor of Technological Education Degree. Before coming into the university, he taught technological education in Scotland, and prior to that he worked in various architectural practices. A long-standing member of the National Executive of the Technology Teachers’ Association in Scotland, he currently holds the position of editor of the TTA Journal.

Keywords: technical, technological, education, curriculum, vocational, academic

Abstract
This paper seeks to discover if fundamental differences are apparent in the delivery of English and Scottish technological education. It will look at the history of technical education in both countries and the political will involved in its development. Furthermore, it will seek to discover if curriculum development has sought to address the needs of both countries and improved or altered the provision of technological education within the two educational systems.

To conclude that the use technology in England and Wales is concomitant with technology in Scotland, is not disputed. As consumers we all use the same products which have the same technologies. Our infrastructure is almost identical, and we are all influenced by the same media. Whilst our cultures may differ slightly, even the advent of devolved government does not impact directly on our use of technology. Indeed the Government positively encourages it through the use of ICT. (Blair, 1999)

Ask any adult in the UK if modern technology has an impact on their lives and they will answer in the affirmative. They are not misguided. Technology is manifestly changing the way we live. As we usher in the 21st century, we take with us current technologies which are on the brink of creating life itself. But society is unsure about technology. It does not trust it because it does not fully understand it. Technology which enables supermarket queues to be reduced is considered to be in society’s best interest, but, paradoxically, the same technology allows ‘Orwellian’ data to be collected on us as individuals. This is considered intrusive. Intensive farming is reluctantly accepted, but genetically modified foods cause public outcry.

Whilst there exists an unquenchable thirst for more technology, a large percentage of the population still prides itself in not being technologically literate. (Ritchie, 1995) An increasing desire exists for user friendly technology. Society wants it, but is less interested in developing and controlling it.

Society in the UK, as promulgated by its government, supports the ideal that technology education is vital in today’s society. In England and Wales, “Design and Technology prepares pupils to participate in tomorrow’s rapidly changing technologies.” (HMSO, 1999, p.1) In Scotland, “Pupils will be better equipped to live purposefully, productively, confidently and wisely in the world of today and tomorrow if they have been enabled to acquire and deploy a broadly based technological capability.” (5–14, 1999, p.52)

Post-war educational thinking in the UK has finally culminated in the attempt to deliver a humanistic comprehensive education, where learning is child centred and individualistic. (Pepin, 1999) The development of the curriculum, however, is still divided between “the philosophical ideals of the educator whose sole concern is the successful development of the full potential of the child, and others where the curriculum is perceived as having more instrumental aims which include the interests of the state and society at large.” (Shield, 1996) These competing ideologies need not be mutually exclusive. In a truly comprehensive system, choice within the curriculum can satisfy both causes.

The academic versus vocational, ‘thinkers’ versus ‘doers’ philosophy, does not sit well with the humanistic view, and most certainly does not put the interests of the child first. The curriculum in both England and Scotland is elitist, whilst purporting to be egalitarian. C.P. Snow is well documented for stating in 1959, that the traditional values of literary culture are dominating education at the expense of science and technology (Snow, 1964). Sadly, little has changed since then.
Technological education in England may be compulsory within the curriculum, but it is subject to manipulation, usually at the expense of technical education. Not all schools in England offer the choice of design and technology and where non compliance is observed in Ofsted inspections, it is not reported. (DATA, 1999, p.32) In Scotland the latest HMI report on Technical Education suggests that a department of three or four staff could not deliver a full technical curriculum. (HMI, 1999, p.31). However, Sam Galbraith, the Scottish Education Minister, stated in a recent press release that “Our technical departments are well staffed and well organised.” He also mentioned that “Technical education is an important area of the curriculum.” (Galbraith, 1999)

This conflicting rhetoric only serves to diminish the already low status of technical education. This is not a new manifestation. Whilst both English and Scottish societies claim the need for a technologically literate society, the spectre of history repeats itself. “England (and the UK) sic. was, throughout the nineteenth century, notably backward in most areas of scientific and technical education by comparison with other major states in northern Europe … By 1910 Germany had 25,000 university students of science and technology compared with some 3000 in England.” (Green, 1999) In Scotland, at a conference on technical education, held in Edinburgh in 1868, it was proposed that “The time has arrived when it is desirable and necessary, in the education of the people, that the principals of science (and technology) sic. should form an important element in the tuition of all classes of the community.” (Conference, 1868)

In 1957, Frazer noted the resistance of grammar schools to introduce technical subjects into the curriculum. In 1961 the Labour Party stressed the need for remaining at the forefront of discovery and engineering. (McCulloch et al, 1985). Almost 50 years later, as we enter the 21st century, grammar schools in England continue to resist offering design and technology. They “remain oblivious to the requirements of the National Curriculum”. (DATA, 1998/99, p.20)

In 1961 the Institute of Mechanical Engineers noted that “Bright boys were not being influenced by headmasters and careers masters to go into engineering but rather the arts and humanities.” (McCulloch et al, 1985)

In Scotland, the SCCC, the principal advisory body to the Secretary of State for Scotland on the school curriculum, published new guidelines on curriculum design for the secondary stages, at the end of 1999. Under the heading ‘The Nature and Purpose of the Curriculum’ it states “The curriculum must provide, in a structured way, the experiences which will help all young people, irrespective of gender, aspirations, culture or social background, to live successful lives both now and in the future. It must respond to the needs both of young people themselves and of society as a whole, and enable them to participate as active and responsible citizens.” (SCCC, 1999)

In 1995, the SCCC published ‘Technology Education in Scottish Schools’ which stated in its introduction that “The increasing importance of the technology component of the school curriculum, in a wider economic context, has been underlined further by the appearance of white papers on competitiveness together with reports from the government’s Technology Foresight Programme and the 1995 Forward Look overview of government funded science, technology and engineering. (May 1995) Technology education, when defined appropriately and ‘delivered’ effectively, has a significant contribution to make to developing the motivated, flexible and highly skilled work force by which the competitiveness white papers set considerable store.” (SCCC, 1995)

Design and technology in England has a wide range of GCSE courses. The most common combination is resistant materials, food technology and graphic products. (DATA, 1998/99, p.24) This is similar to Scotland where the most common areas are craft and design and graphic communication. The area within the technology curriculum in both England and Scotland which is most at risk, sits at the cutting edge of technology. In England, electronics and systems and control account for only 24 and 18 percent of the design and technology delivery respectively. (DATA, 1998/99, p.24) In Scotland, technological studies, which includes electronics, pneumatics, structures, mechanisms and computer control, is steadily declining. (HMI, 1999, p.16)

The problem is further exacerbated in Scotland where schools are unilaterally stopping the delivery of technological studies. In the school session 98/99, Glasgow District Council had 31 secondary schools of which 16 had technological studies in S4, in 99/2000 the schools reduced to 29 and the delivery of technological studies had reduced to 12 schools. The next session will maintain 29 schools, but technological studies will be further reduced to being delivered in only 8 schools. A 50% drop in three years. (Sourced from Glasgow District Council, Education Department). Yet this year saw the launch of a resource kit based on micro control technology, delivered
free to all schools in Scotland. The kit, which is specifically designed for technological studies, was prepared and funded by the Higher Still Development Unit in partnership with the UK Offshore Operators Association. Minister for Enterprise and Lifelong Learning in Scotland, Henry McLeish, stated that “The offshore industries provide an excellent opportunity to give real life context to the teaching of technology at all levels in Scottish secondary schools.” (McLeish, 1999) A number of these kits are lying dormant in schools where technological studies has been dropped.

Today, as before, there is a need for engineers in both Scotland and England, particularly in electronics and control. The Institute of Electrical Engineers has a particular interest in the teaching of electronics and systems and control with design and technology. (Roberts, 1999) The CBI notes that specific skills shortages exist in engineering. (CBI, 1999) “Letting pupils opt out of design and technology is turning the clock back.” (Dyson, 1999)

In England, design and technology is compulsory at all key stages. In Scotland, the 5–14 guidelines stress the importance of technology in the primary curriculum. But primary teachers in England are wary about teaching technology. They are unsure as to what the subject is and have had very little, or no, training towards it. (Stables, 1999) This is also the case in Scotland where a study was carried out between 1993 and 1995 which found that confidence in the delivery of technology by primary teachers was very low. The type of help sought by teachers included: “In service courses, print based resources, time to think and prepare, more and improved equipment, a school policy on what to teach and when, advice from specialists, and improvement in support and co-ordination within the school.” (Harlen & Holroyd, 1995)

In both England and Scotland secondary technical departments run extra curricular classes in the form of various Young Engineers Clubs. These clubs are well supported by industry and in particular, by enthusiastic teachers of technology. In a recent evaluation on engineering education schemes in Scotland, carried out by Brian Woolnough, one of the recommendations made was that “Engineering education should be further provided in the mainstream curriculum as well as in extra curricular activities.” (Woolnough, 1998)

There is no fundamental difference in technology in England and Scotland. The technological curriculum is almost identical in both its delivery and its demise. Key Stages 1 and 2 in England fail to deliver a technological component due, in the main, to lack of training for primary teachers. Scotland suffers the same problem in the delivery of 5–14. The technological component at secondary level is disappearing in both countries. The status of the subject is considered low by head teachers, and the public at large. In a comparative study in America it was found that “Vocational teachers find their niche by accommodating those students who have the greatest difficulty in conventional academic classes.” (Little & Threatt, 1994) In considering the actions of grammar schools in relation to technical education, a parallel situation is evident in the United Kingdom.

It is clear from this study that industry supports and desires technical education in the curriculum. The Government purports that technical education is not only desirable but essential to our economy. Indeed this has been the case for the past hundred years. But I would suggest that until we break down the barriers of academic, high status and vocational, low status education, this dilemma will persist for the next hundred years.

Technical education in both England and Scotland must be seen not only as an essential and integral part of the curriculum, but also as being the only subject area in schools which contextualises knowledge. (Layton, 1993) The government claims to support this view: “Often, insufficient attention is given to the impact of technology on people’s lives, the physical environment and the world of work. The current curriculum framework in secondary schools frequently inhibits the development of an integrated learning experience for pupils.” (SCCC, 1995, p.1) The good intentions and work of all technology teachers will continue to be undermined by feelings of inadequacy, anxiety, powerlessness, uncertainty and alienation, until they become alert to rhetoric, well intentioned but oblique leadership and complex outside interests. (Hansen, 1996)

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