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**Technology Teacher Education in England**

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**Introduction**

This entry provides an insight into the turbulent and recently disappointing events in the history of Design and Technology (D&T) teacher education in England over the last 150 years. It is a complex journey that needs to include a review of the generic history of teacher education in England, the differing educational needs of children, the changing role of D&T as a school curriculum subject, the requirements for an appropriately trained workforce to meet the economic needs of the country, and how various government educational initiatives and interventions (Gillard 2018) have affected how teachers in general and D&T teachers in particular have been and still are trained today. All these factors are inseparably intertwined. Therefore, this entry discusses them all together in chronological date order.

The subject now called D&T and the training of teachers to teach D&T in England have a relatively short history compared to some subjects. However, during its existence, even the name of the subject has changed several times following adjustments in direction and understanding concerning what should be learnt and therefore taught. It was first was known as “Handicrafts.” Subsequent terms included “Woodwork”; “Metalwork”; “Manual Training”; “Craft”; “Technical Subjects”; “Design”; “Craft, Design, and Technology” (CDT); and “Technology.” Finally, the name “Design and Technology” (D&T) was selected in the early 1990s. The subject’s status and place in the overall school curriculum altered with each name change and the overarching factors listed above, all of which have affected the training provided for those wishing to become D&T teachers.

**Teacher Education**

In England, the systematic provision of learning for most children has only developed over the last 200 years. Before this, boys were largely taught the family trade by their fathers, and girls were kept at home learning housekeeping, cooking, and how to look after younger siblings. Only wealthy upper-class boys were schooled, and their education was confined to academic not practical subjects. The first training schools and colleges teaching people to teach were set up in the early nineteenth century. At first, only elementary teachers (teaching students aged 5–11 years) were trained. It was believed that as long as a secondary teacher knew their subject, they did not need to be taught to teach. Early teachers of “Handicrafts” were usually classroom teachers
who enjoyed making things or practicing craftsmen who became teachers. By 1850 there were over 30 teacher-training colleges, established mainly by churches and charities. The courses usually lasted a year or less and involved mainly female student teachers. Training started at the age of 16 and no prior qualifications were necessary. Student teachers received education themselves, as well as teacher training. However, up to 1914 the most popular route into teaching was the national student-teacher scheme—a school-based apprenticeship model where students as young as 13 years, who fulfilled certain scholastic, moral, and physical conditions, were apprenticed to selected headteachers for 5 years. On completion of their apprenticeship, they could sit an examination that enabled them to qualify for a place at a training college, or they could immediately become an uncertified teacher. These uncertified teachers significantly outnumbered those with a training college Teacher’s Certificate as they were cheaper to employ.

The 1870 Elementary Education Act made education compulsory for children aged between 5 and 13 years, which prompted an increase in both certified and uncertified teacher numbers. However, by 1890 concerns were being raised about the educational standard of student teachers. This led to the raising of the entry age for such teachers to 14 and then 15 in 1900 and also to the development of student teacher centers where such teachers were given extra tuition. Around the same time, the Cross Commission on Elementary Education recommended that universities set up faculties of education with a training college attached to foster the academic study of education and research and as another way to drive up academic standards within the teaching profession. This was an important development as it helped to end the isolation of training colleges, overcome the religious domination of teacher training, and increased the supply of qualified teachers. In 1904 the preparation of teachers officially became degree bearing in addition to providing a teaching qualification. It was also at this time that the newly formed local education authorities (LEAs) began providing school placements for the preparation of secondary teachers; elementary placements had been available for over half a century.

Growing criticism of the poor academic standard of student teachers escalated at this time, leading to the abolition of this route into teaching in favor of an extended secondary education for prospective teachers. The pendulum had swung from a school-based apprenticeship model to a university-/college-based model of teacher education. This model remained in place till the early 1990s when the pendulum swung back to embrace a number of school-based models—with dire consequences for teacher education in universities and for D&T in particular.

Teacher Education for Handicrafts and Its Successors

In England, Handicraft was not usually an accepted part of the curriculum for compulsory education until the beginning of the twentieth century, when teachers began to be trained to teach “Workmen’s Crafts,” “Cookery,” and “Needlework”. Cookery teachers were taught in cookery schools initially set up to educate young working-class women in culinary skills as a contribution to the improvement of family life among lower-income groups. This approach was not popular even though more expensive classes for wealthy women subsidized the cheaper classes for working women. With the formal introduction of culinary education into schools in 1906, a Certificate for Cookery Teachers was established. Colleges training handicraft teachers were also set up around this time. One example was Shoreditch Training College, which took advantage of a scholarship scheme set up by London City Council in the early 1900s and launched a teacher training institution specifically for training handicraft teachers. In 1907 this became a department of Shoreditch Technical Institute, which in 1919 was renamed Shoreditch Training College where D&T teachers continued to be trained until its merger with Brunel University in 1980.

In 1908 the government’s Board of Education (BoE) issued the first set of regulations for the training of secondary school teachers. It was at this time that the number of training routes expanded. A 1-year training program restricted to graduates and concerned solely with
professional training was approved. Two- and three-year courses, later extended to 4 years for those wanting both graduate status and a teaching qualification, were also added to the routes available.

It was not until 1921 that secondary handicraft teacher training was established in Loughborough, using the post-World War 1 emergency training scheme for ex-service personal. The provision used the already established workshop facilities where munition workers were trained during the war. By 1930 a permanent department for handicraft teacher training and a 2-year certificate course had been launched. Woodwork was the main craft practiced although metalwork was also developed and design was considered an important aspect of the training. A postgraduate course was added in 1934. After this the numbers at Loughborough increased rapidly, partially due to it being an all-male college training secondary teachers when the majority of teachers were still female. Loughborough went on to establish a reputation for excellence, firstly in training handicraft teachers and then D&T teachers over the next 70 years.

Immediately after WW1 there was a wave of enthusiasm for teaching as a career, with large numbers of particularly men becoming teachers. However, the economic crisis of the 1920s put an end to the enthusiasm for teaching as a career, and teacher training programs lacked development during the interwar period. Debate concerning academic versus professional training continued nonetheless, and during this period the BoE gradually relinquished its control of the examination of student teachers. This gave universities greater autonomy to examine and qualify teachers.

The McNair Report in 1944 concerning the supply, recruitment, and training of teachers and the 1944 Education Act were important in shaping both education and teacher training in the post-WW2 period. The new Ministry of Education emerging from the 1944 Education Act estimated that raising the school leaving age to 15 as part of the Act required 13,000 extra teachers over and above those needed to meet natural wastage. To overcome this an emergency training program was begun, with additional grants for ex-service personnel in a Further Education and Training Scheme. Throughout the late 1940s, even though the economic situation in the UK required a substantial increase in craft and technical training, the pace of change in school-based practical teaching was slow. Courses in manual training continued to be provided in certain schools, for less academically able boys, while girls were allowed to study Domestic Science and Needlework. However, there was little change in what or how students were taught. This lack of development likely reflected the status quo that remained in the teacher training institutions.

The postwar bulge in the birth rate, the raising of the school leaving age, and the existence of a more “affluent society” resulted in increased numbers of children staying at school after the normal leaving age, all of which exacerbated the need for more teachers. By the early 1950s, to alleviate the situation, LEAs set up 13 Area Training Organisations to coordinate the provision of teacher training and opened 76 new training colleges. These colleges provided nongraduate primary training courses, and universities provided postgraduate and secondary graduate training courses. However, the pace of development within practical subjects in relation to both student teachers and students in schools continued to be extremely slow. In 1959 in recognition of this lack of curriculum development, Snow (2013) in his Rede Lecture stated that the traditional values of a literary culture were dominating education at the expense of science and technology, which he argued would cause Britain’s decline as a world power if the balance was not redressed.

Throughout the 1960s pockets of innovative training for teachers of practical subjects could be found. One such course was at Leicester College of Art, which agreed to accept Industrial Design graduates from Newcastle College of Art and Industrial Design into their 1-year Art teacher training program. This was in conjunction with Leicestershire LEA, a forward-thinking authority in terms of Design Education. They provided teaching practice placements in newly formed comprehensive schools with open-plan design departments. In return, the design departments benefited from the design expertise of these
student teachers. It was from this course that the first female woodwork/design teacher graduated in 1965, that being the author of this entry.

**Toward Craft, Design, and Technology**

It was not until the early 1970s that changes in society became so marked that it caused inescapable pressure upon the government to change the pattern of education across England as a whole. As part of this push for change, in 1972 the James Report recommended that teaching become an all-graduate profession. In terms of technical subjects, change came about through an increased cognizance of the need for students to possess a greater understanding and awareness of technology, its future implications, its potential, and its exploitation.

Industrialists, educationalists, and forward-thinking teachers were together able to persuade the government that changes to technical subjects were essential. This led to the renaming and regrouping of practical subjects into Craft, Design, and Technology (CDT), merging resistant materials (wood, metal, plastics) and encompassing other radical content changes. No longer were students taught only craft skills; they were encouraged to design whatever they were making. In this new curriculum teachers had to reconcile two conflicting demands: they were required to give maximum freedom to students to develop their own ideas and pursue any approach that the student wished to follow while providing a structure that enabled them to feel secure, act responsibly and safely, and achieve a satisfactory outcome that met the expected learning objectives.

Unfortunately, the teachers required to teach these new skills were in short supply. In the early stages of the transition, there was little appropriate training for existing teachers, and few initial teacher training (ITT) courses could provide the new skill set, mainly because those teaching the student teachers were themselves ill-equipped, beyond their excellent craft skills, to teach design skills and the new philosophical understanding required for the activities expected in CDT. It was also at this time that two polarized camps developed within the subject: those who saw creativity, designing and making as the necessary way forward, and those who believed that the subject should be concerned with hard technology and a sound scientific knowledge base. Nor could this latter group easily accept that what went on in Home Economics and Needlework should play a part in the new CDT curriculum. This spilt in fundamental beliefs about the nature of the subject has never been successfully resolved, and in recent times the lack of a single, coherent philosophy and epistemology presented to the outside world has been one of the causes for the demise of D&T in English schools and therefore a reduction in the number of D&T teachers needed today.

In the 1980s several influences affected what was taught in schools and on ITT programs. One such influence was the Technical and Vocational Educational Initiative (TVEI), which shaped the whole curriculum in many secondary schools and influenced teacher education program design with the addition of mini-enterprise activities and developing information technology (IT) skills alongside developing design skills and practical competences in all three resistant materials. TVEI’s purpose was to help prepare students aged 14–18 for the demands of working life.

One positive effect upon CDT education was the injection of money from industry. This provided much needed expertise and hardware and promoted a holistic approach to the design process carried out by students, encouraging business awareness and industrial links. A second influence was new examinations at the end of compulsory education. This affected CDT as it allowed the development of examination courses that were better suited to assessing CDT capability than the traditional examinations had been. A third very important influence in the late 1980s was the introduction of the National Curriculum for children aged 5–16 in all state schools in England and Wales. Its purpose was to ensure that all children studied essential subjects in order to provide an all-round education. CDT was renamed D&T and was included as one of the ten compulsory subjects. This gave D&T status it had never had before. All state schools had to provide D&T for all students. Training implications were
enormous. Many teachers who understood the new philosophy, as well as those who did not, needed support to provide D&T for all, rather than only for those who in the past had chosen to opt for CDT.

D&T ITT rose to the challenges. There was a surge in the number of D&T students on 3- and 4-year undergraduate degrees and 1-year postgraduate degrees, supplemented by many who retrained on 2-year D&T top-up degrees due to the demise of heavy industry across Britain at that time. However, at the same time, the allocation of places for ITT began to be squeezed by the Department of Education. These allocations were based on the number of new teachers needed for each subject nationally (without attention to local requirements), so that sufficient teachers were recruited and over-recruitment was avoided. Universities were penalized for any over- or under-recruitment. Allocation of places became even more problematic when in 1996 the Office for Standards in Education (OFSTED) began inspecting ITT and an institution’s OFSTED result was used in the formula to determine the allocation of places – only those awarded a Grade A were given their full allocation. This inspection regime meant that institutions had to stick rigidly to an increasingly prescriptive government-led approach within a new mandatory national curriculum for student teachers and a standards-driven model of assessment (Robinson 2006), all of which left less time for teaching subject knowledge to student teachers. This impacted on PGCE programs, in particular in D&T where first degrees are not well-aligned to the full spectrum of subject knowledge laid down in the Subject Knowledge Audit (SKA) which student teachers are required to complete before being awarded Qualified Teacher Status.

At this time all undergraduate programs training secondary D&T teachers adopted a similar model for their programs. Training to teach, educational theory, subject application, health and safety, and school placements were confined to the final year of study, while appropriate subject knowledge was taught in the preceding years of the program. Different ITT institutions tended to emphasize differently the various aspects of subject knowledge that they believed were required for their students to become sound D&T teachers. This new model for ITT enabled PGCE and undergraduate student teachers to be taught together across an institution, no matter what subject the student teacher was going to teach. OFSTED inspections mainly targeted this “professional year” with all subject strands being judged as a single entity. During this year PGCE students were offered minimal subject knowledge inputs due to the burden imposed by the time-consuming mandatory curriculum being inspected by OFSTED. This shortfall in subject knowledge and understanding led to the development of Subject Knowledge Enhancement (SKE) courses, which became a prerequisite for many PGCE applicants who did not have the breadth of skills necessary from their undergraduate degrees. These SKE courses lasted for varying lengths of time, the most successful being a 1-year course during which the missing elements in a student’s subject knowledge were addressed, although the financial implications of this extra study had a detrimental effect on recruitment to PGCE programs.

The allocation regime and OFSTED inspections affected the viability of programs during a financially difficult time for all universities. The issue of lower target numbers was further exacerbated by the government’s pendulum swing decision in favor of a return to a school-based/apprenticeship model of teacher training in partnership with schools – a decision that was made without university consultation or reference to the inadequacies of the student-teacher system used in the past.

**Current Routes to D&T Teacher Qualification Status**

Throughout the 2000s and beyond, numerous other legislative and policy changes increasingly emphasized school-based training. There are now many routes into teaching and achieving Qualified Teacher Status (QTS) (see Table 1), with the majority being school based. However, none of these initiatives have improved ITT recruitment.
In terms of D&T specifically, two further factors have had a marked impact on ITT recruitment. Firstly, after much debate and protestations from the D&T community and the wider community, a decision was made in the revised, slimmed down National Curriculum (2013) that D&T would no longer be a core subject nor would it be compulsory after the age of 14. Secondly, in 2016, the English Baccalaureate (EBacc) was introduced: a performance measure for students who achieve a good pass in six core subjects – which no longer included D&T – reinforcing the view that D&T is not an important subject.

All these factors have caused a crisis in D&T ITT recruitment. By 2018 a third of schools were a D&T teacher short. All secondary undergraduate D&T ITT programs in England had closed, and the number of university PGCE programs had dropped to 21. While there are many school-based training places on offer, uptake for places across both university and school-based ITT is 50% below the government target. This is a sad state of affairs. Those of us who have been passionate about D&T since its inception hope this change will be reversed, but there is currently despondency and it is difficult to see any sign of a shift that will reinvigorate recruitment to the subject or its presence in schools.

### References

