Food in the school curriculum in England: Its development from cookery to cookery

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Abstract
The view of the authors is that the teaching of food in the school curriculum has varied throughout its history in order to meet political aims rather than educational ones. In this article they highlight the social and political changes that have influenced the teaching of food from its inception in the mid-1840s through to the present day. They argue that the political influences have been detrimental to the value of teaching about food and its potential for contributing to pupils' overall education as well as what pupils should know, understand and learn about food and where it can be taught in schools.

The teaching of food as cookery is traced from its introduction in the elementary school system, when it was for girls only, then to its development into domestic science, a subject for more academically able girls and the Sex Discrimination 1975 ensuring its availability for boys and girls. This was followed by the transformation into home economics, with a wider curriculum agenda, in the 1970s, the introduction of higher education degrees and the National Curriculum in 1990, which put food technology within design and technology. Changes within the National Curriculum are considered as are recent events impacting on the teaching of food, up to 2015 when GCSE Food Technology was replaced with GCSE Food and Nutrition and A Level Food Technology, which supports pupil progression into a range of food related degrees and careers, was removed.

The article reviews a range of literature in order to consider the value of teaching food, the current situation in schools in England and the possible future role of food in the school curriculum.

Key words
food, technology, education, teaching, design and technology, school curriculum, England

Introduction

The history of education in England, as elsewhere, is a reflection of the country's political and social history. Popkewitz (2011: 15) points out 'the idea of school subjects was, in one sense, an invention of the nineteenth century'. Schooling has, at various times, promoted 'civic virtues' (Popkewitz 2011: 4), scientific thinking and, with the growth of urbanisation and industrialisation, the purpose of education became that of enabling children 'to become productive citizens' (ibid: 10). More recently, with globalisation and increasing reliance on technology, 'the emphasis has shifted again and a curriculum based on transferable knowledge and skills is advocated…' (DfE 2011: 14/15). This changing emphasis is based on the assumption 'that there is a direct causal connection between levels of educational attainment and economic growth' (Loxley et.al. 2014: 174), an important notion for a subject such as design and technology (D&T).

In this article we draw on a range of literature and our own research to consider the changing nature of food on the school curriculum. Our research has been conducted over the past 10 years with university staff, teacher educators, teachers and pupils and has looked at the rhetoric and lived experiences of those involved in teaching about food (see Rutland 2006, 2013 and Rutland and Owen-Jackson 2012a, 2012b, 2015a, 2015b).

The development of the teaching of food in the school curriculum

With social and political concerns over the health of the lower classes, domestic economy was introduced in the elementary state system in the 1840s to help improve basic living standards. The 1870 Education Act introduced 'plain needlework' to the curriculum and, in 1878, 'domestic economy' - cookery, needlework and laundry work- was made compulsory for girls. In 1892 practical cookery was established in the code of Regulations for Public Elementary School, along with appropriate grant provision (Geen et al., 1988: 8).

In contrast, food did not appear on the curriculum of grammar schools until the early twentieth century when domestic science, with an emphasis on nutrition, was introduced. However, it was a seen as a practical subject and there was little attempt to teach underlying scientific principles, which reduced its educational value and acceptability as an entry qualification for academic courses (Rutland, 1984).

By the mid-twentieth century, with changes in society and industry, there was recognition that educational provision needed to change with the Crowther Report (DES, 1959) arguing for 'alternative roads' in education. This was

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followed by the Newsom Report (DES, 1963) which stressed the importance of practical experiences for children and the need for education to relate to children's lives. With the raising of the school leaving age to 16 and the introduction of comprehensive education, there was a further need to reconsider the purpose of education for all. Around this time there were several projects which modernised the teaching of woodwork and metalwork (Schools Council 'Design and Craft Project'1966, based at Keele University and known as the Keele Project; Schools Council 'Project Technology' 1967 and RCA Schools Technology Project 1975-78). There were few developments in the teaching of food or textiles, which remained focused on the development of domestic skills, mainly for girls.

Following years of economic expansion, in the 1970s the UK began to experience recession which led the Prime Minister of the day, James Callaghan, to the famous speech at Ruskin College (Gillard 2010). Callaghan declared that too few pupils were studying science and technology, which he thought was having a detrimental effect on Britain's economic performance. As a result of this speech many educational initiatives were introduced focussing on technological and vocational education, domestic science developed into home economics and introduced aspects of science and psychology into its teaching. At the same time, traditional views were being challenged by educationalists and feminists and the Sex Discrimination Act (1975) made sexual discrimination unlawful in schools, requiring equality of access for boys and girls to all areas of the curriculum, including both 'craft' areas. There was no major change to the subject, however, until the introduction of the National Curriculum (DES, 1990).

The mid-1970s also saw the introduction of undergraduate degree courses in home economics, including science-based BSc degrees, humanities-based BA courses and B.Ed courses, which prepared future teachers of the subject. Thorne (1979) explored the employment followed by home economics graduates and found that they took one of two options: either an educational/social occupation or a commercial one. This led her to suggest that home economics had two faces, the educational/social and the commercial, and she saw difficulties in reconciling these two aspects in courses of study that attempted to command both academic and professional respect – a view which was to be reflected in later reports.

Secondary school home economics was further developed in the 1980s with the introduction of courses which emphasised the physical, chemical and biological principles underlying the craft skills. They required a sound knowledge of major concepts, applied knowledge and the skills of observation, analysis, planning assessing, communication, comprehension, verbal fluency and numeracy (Nuffield Home Economics, 1982: ix). These courses required teachers to have a basic knowledge and understanding of the scientific principles of chemistry, biology and physics, yet it had been noted that many home economics teachers were least qualified and interested in these aspects of the subject (Davies, 1981; Rodwell, 1983; Rutland, 1984).

The introduction of the National Curriculum

The biggest development in the teaching of food in schools came in 1990 with the National Curriculum (NC). The clearly stated aim of the NC was to prepare children for the 'opportunities, responsibilities and experiences of adult life' (DES 1990: 1), and it comprised 10 subjects, one of which was Technology. The rationale for the inclusion of these particular subjects and not others was not given (White 2004) but it has been noted that the list of subjects is similar to that drawn up in 1904 for state secondary schools (Aldrich 1988), indicating that there was little that was innovative about the 'new' National Curriculum. Technology, however, was new and was compulsory for all pupils aged 5-16 years, for the first time anywhere in the world. Graham and Tyler (1993) report that even the Chairman of the National Curriculum Council was unsure where the impetus for D&T originated but Layton (1995) suggests that it was the government's recognition of the importance of technology to the British economy.

A D&T Working Group was established to develop a curriculum in which pupils were to design and make useful objects or systems, thus developing their ability to solve practical problems (DES, 1988). However, the Chairman of the Working Group acknowledged that there was uncertainty about this new subject and that it was 'left to the working group to invent it' (Graham and Tyler 1993). Smithers and Robinson (1992: 6) note that the resulting subject, 'design and technology' became less about designing and making and more about 'generalised problem solving without a specified knowledge base'. Williams, Iglesias and Barak (2007) later noted the importance of successfully guiding students through the process of problem-based learning (PBL) in technology education, while at the same time developing and incorporating a body of relevant knowledge.

Following numerous discussions and debates, D&T was finally presented as a new subject within Technology

(DES, 1990). Design and technology incorporated art and design, business studies, craft, design and technology (CDT) and home economics. Information technology was a separate subject within Technology. Some home economics teachers saw this alignment with D&T as securing a future for food in the school curriculum. In hindsight it could have been a mistake; its inclusion in D&T has meant that much teaching of food technology has been influenced by the requirements of other subjects, for example pupils being asked to 'design' food products including them 'drawing' food dishes, often with limited underpinning knowledge and skills, rather than engage in food product development (Rutland and Owen-Jackson 2012a, 2012b).

The introduction of food technology was a big change for home economics and the transition was not easy; food technology had to incorporate new aspects and new ways of working (Jackson 1992). This presented an opportunity to modernise the content and teaching of food, as woodwork and metalwork had previously done, to make it relevant to contemporary society but the lack of clarity about D&T and food technology caused uncertainty in those charged with teaching it. Depending on their own preferences, some teachers focused on the science of food, some on the design and creative aspects and others on the craft skills and vocational aspects. It could be argued that this initial lack of clarity, and the variety of pathways taken by different teachers, has led to a continuing misunderstanding that D&T is nothing more than a modern version of the 'handicraft' subjects of cooking, sewing, metalwork and woodwork.

There was little support for home economics teachers making the transition to food technology. Rutland (dt-itt-googlegroups.com, 15th October 2014) noted that initially there were concerns about the emphasis on industrial practices and a lack of understanding about how to 'design' with food. She also noted that some home economics teachers still wanted to teach children to cook as a life skill and resisted the expectation that pupils should think, investigate and apply their scientific understanding of ingredients, processes, equipment and technologies through practical activities related to food product development. A study undertaken to investigate the changes to home economics with the introduction of the National Curriculum (Jackson 1992) found that there had previously been much common practice in the content and teaching of the subject but the introduction of the NC led to greater diversity. This suggests that there was no common agreement on the content of food technology in the NC, or how to teach it.

Uncertainty about design & technology led to (some) poor teaching with Smithers and Robinson (1992: 5) declaring 'Technology [which comprised D&T and Information Technology] in the national curriculum is a mess.' However, they went on to say that what was being taught was 'very different from what was intended' (ibid). In response, a report by HMI into the teaching of Technology (DES 1992) found:

- under-skilled teachers finding the requirements for D&T over-complex, unhelpful and difficult to understand
- rotational arrangements [where pupils rotate between the different subjects within D&T] hindering progress
- too much breadth in subject content and limited manufacturing taking place.

Following this, in 1992 there was a revision of curriculum requirements (DES 1992). A year later Sir Ron Dearing (SEAC 1993) recommended slimming down the curriculum and this led to further revision of the NC (SCAA 1995). These constant changes highlight the challenges experienced by teachers attempting to understand what was required by D&T, hampered by the government's inability to clearly define what was expected and the almost complete lack of support offered to teachers in implementing the change.

Teachers' uncertainty and lack of confidence led to a plethora of resources to support classroom practice, including from DATA (The Design and Technology Association), the Nuffield Foundation, the Technology Enhancement Project (TEP) and the Royal College of Art (RCA) Schools Technology Project. Each offered their own perspective on the subject and provided ideas for classroom work but did little to develop and strengthen teachers' overall understanding of D&T. There was some support offered to food technology teachers, for example in 'Design and Technology in the Secondary Curriculum' (The Open University 1994) was a suggested teaching scheme in which pupils worked in teams to develop food products to sell in a fictional business. They would learn to analyse existing products for taste, aesthetics and quality, undertake research and product development with consideration of nutrition, cost and quality, make products – developing skills and demonstrating health and safety – and learn some business, entrepreneurial skills. This was completely different from home economics and captured the character of D&T; it seems a pity that this sort of activity did not become more widespread in the early stages of food technology teaching.

The National Curriculum was revised again in 1999 (QCA 1999), with some feeling that the revisions dealt with the

uncertainty by making the subject 'more straightforward, more limited and more safe' (Kimbell 1999: 3). Whilst this may have been true in some aspects, the new curriculum required pupils to learn about smart and modern materials. For teachers of food this was a major challenge, requiring them to be confident not only in food science but also in the development of modern food production materials and techniques, many of which were only suitable for mass manufacturing and not for standard kitchens.

After the 1999 revision there was a period of consolidation for the NC and D&T was establishing itself on the curriculum. However, a survey by the Design & Technology Association (2004) found that schools were reducing the amount of time for D&T and that some were no longer teaching food technology, mainly because of staff shortages. Then, in 2005, it was reported (QCA 2005: 5) that the DfES had concerns over 'the quality of pupils' experiences in practical cooking'.

There were other problems with food technology; a report by Ofsted (2006: 2) identified 'a lack of clarity about the relationship between the teaching of food as a life skill and the use of food as a medium for teaching D&T'. The report considered that too little time was spent on learning to cook nutritious meals (life skills) and too much time on low level investigations and written work. However, it also noted that 'in the best provision, pupils cooked or engaged in practical activity every week and theory was taught in a lively manner…. Pupils' research and analysis were tightly tailored to their product specifications. Product development briefs were demanding, realistic and, for older pupils, individualised.' (Ofsted 2006: 2). This demonstrated that food technology, well-taught, could teach both the practical skills of cooking and the broader skills of D&T. The report recommended that national bodies should clarify the nature of food technology within the secondary school curriculum but, to the detriment of the subject, this never happened.

There was also a concern with D&T generally; over the first 10 years Ofsted consistently reported that skills in designing lagged behind those in making (Ofsted 2000) and that designing was not taught as well as practical skills. This led to the National Strategy for Key Stage 3 (pupils aged 11-14 years) (DfES 2004) focussing in D&T on the teaching of design. Teachers were supported with resources and professional development which encouraged them to use a variety of strategies to support pupils' development of creativity and design skills. This had an unexpected negative effect on food technology as many teachers began asking pupils to 'design' food products using strategies that were inappropriate for the medium, and to 'draw' their designs, again a strategy not appropriate for food (Rutland & Owen-Jackson, 2015a).

There was another revision of the NC in 2007 (QCA 2007). This identified the key concepts to be taught, together with the key processes and the subject content. Unfortunately for food, the curriculum document included the statement that pupils should study 'at least one of food or textiles' (QCA 2007: 55). No rationale was given for imposing this choice but it was detrimental to the study of food in some schools.

In 2008 the government introduced 'Licence to Cook' into schools. This programme was designed to ensure that all young people learnt 'basic cooking skills', diet and nutrition, hygiene and safety and wise food shopping. In implementation, however, many teachers did no more than teach cooking skills using the 'dem and do' approach (Ofsted 2011). Although the programme was not intended to replace food technology lessons, time constraints on the school curriculum meant that in practice it often did so. The Licence to Cook programme lasted only three years but the resources were used by schools long beyond this.

Twenty years after its introduction, the initial uncertainty about the nature of D&T continued. Ofsted (2011) reported that pupils' experiences were varied, some being taught interesting and challenging knowledge and skills whilst others were still learning old-fashioned skills through 'unchallenging' work. However, they also noted that 'the study of food…is an integral part of D&T in England' (Ofsted 2011: 49). In the same year, a government consultation on the NC (DfE 2011) supported this, 78% of respondents thought that D&T should remain in the NC and 24% thought that food technology should remain in D&T. It is difficult to explain, therefore, why the government proposals for the revised NC suggested that 'food' be separated out from the subject content for D&T (Morgan, Jones and Barlex 2013).

Current curriculum developments

Initial government proposals for a new NC D&T curriculum (DfE, February 2013) were disappointing and dubbed as a return to the 'make do and mend' mentality of post-war Britain. The MP Peter Luff (2013) cited three themes: the narrowness of focus returning to the 1950's 'do it yourself' curriculum and basic craft and household maintenance'; a lack of academic or technical challenge and a reduction in value and popularity, reinforcing the perception that applied subjects are less valuable. In the proposals there was no mention of designing and making with food and

the underpinning knowledge, understanding and skills, only a focus on pupils learning to 'cook'. The level of protestation led the government to review its proposals, proposing a modernised D&T curriculum and food retained in D&T for pupils aged 5-14 years (DfE, July 2013). However, within D&T, 'cooking and nutrition' was also a requirement for pupils in primary and lower secondary school. This caused some confusion, whilst pupils were expected to design and make with food ingredients, working in home and industrial contexts they were also required to 'learn how to cook'. Learning how to cook is described as a 'crucial life skill' but the curriculum document does not make clear how this requirement aligns with the nature of D&T. Nor is it clear how learning to cook without an understanding of ingredients, food science and modern food technologies will prepare pupils for their future lives or employment in the twenty-first century.

Following the 2013 NC review, qualifications were also reviewed and the GCSE (for pupils aged 16 years) in D&T: Food Technology was scrapped and replaced with a new GCSE in Food Preparation and Nutrition, initially called GCSE Cooking and Nutrition. The name was changed after the consultation process but the content remained the same (DfEa, February 2015). The content of this is highly prescribed by government and some claim that it is not relevant for pupils, not practical for schools and that the title will deter boys (Clark 2014). The new examination focuses on teaching practical cooking skills, developing an understanding of nutrition, food provenance and the working characteristics of food materials. Aspects of food science are also required but with the long list of other content, particularly the extensive list of skills to be learnt, it is difficult to see how food science can be taught in any depth. The assessment includes a written examination and a three hour practical task in which candidates prepare, cook and serve a pre-planned menu of three dishes. Fifty per cent of the marks available are awarded for candidate's theoretical understanding of food preparation and nutrition, 35% for the food preparation task and just 15% for a food investigation task in which candidates show their understanding of the working characteristics and functional and chemical properties of ingredients. Barlex (2014) says of the new examination 'one of its main intentions is to equip pupils to choose and cook food that is healthy with regard to combating the obesity crisis', reflecting political concerns about levels of obesity in the UK. Research by Rutland and Owen-Jackson (2015b) suggests that this examination would be considered academically unsuitable for some pupils. It may have breadth but lacks depth in crucial areas such as related science and technology and will not prepare pupils for work in the food industry, other than catering. The government seem either unaware or unconcerned with this consequence, they believe that the qualification 'will encourage students to make informed decisions about a wide range of further educational opportunities and career pathways as well as to develop vital life skills that enable them to feed themselves and others affordably and nutritiously, now and later in life' (DfE 2014: 10).

The government also stated that at Advanced Level (pupils aged 16-18 years) 'food technology has been removed as an endorsed route within D&T as feedback from higher education practitioners and subject specialists indicated that it did not fit comfortably within this subject. We have decided not to develop a separate food A level as had been done at GCSE' (DfE, 2015: 17). This is a major drawback to those pupils who wish to continue their studies in food science or nutrition, leaving them with no pathway through to higher education. Although there are vocational courses available (for example, the FDQ Level 3 Diploma in Food Science and Technology, which has no UCAS points and WJEC Level 3 Diploma in Food Science and Nutrition, in which the assessment focusses on nutrition rather than food science) there is now no academic A level course for pupils to take alongside other science courses that would enable them to develop an understanding of food as a material in food product development and link their scientific and technological understanding with practical food preparation. Such a qualification would prepare pupils for work in technical, scientific and other areas of the food industry, as well as enabling them to become informed consumers about the foods they eat. We believe that the lack of such a qualification will, in the long-term, have a detrimental effect.

So why teach about food in the school curriculum?

In the early development of the school curriculum in England, the introduction of 'manual crafts' was linked to the country's industrial development (Loxley et.al 2014). Similarly, the origins of food in the school curriculum are philanthropic and utilitarian, linked to providing training for low paid employment (Rutland 1997, 2006). Despite many changes the subject has found it difficult to shake off this low status, utilitarian, view (Attar, 1990; Cockburn, 1991). As Brennan (1986: 225) notes 'subjects which have been exclusively skills-based have borne unfavourable comparison with the well-established mental disciplines'. Food suffered further, with its domain being the home and family 'a significant characteristic of female-dominated occupations and disciplines is that they lack prestige and are low in power' (Horridge, 1990: 87).

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Despite changes in nomenclature there was little change in the teaching of food until the introduction of food technology as part of D&T in the National Curriculum. In food technology the focus shifted to teaching pupils about the food industry, food product development and mass production. In 1996 it was stated that food technology '…can help pupils to develop an awareness of some of the issues (technical, human, production, economic, social and moral) involved in producing food on a large scale which is safe to eat. From this they can develop a broader understanding about food than can be gained from their own small scale operation. They can then apply what they learn to their own food production activities' (DATA 1996:7). It went on, 'This is not to suggest that teachers and pupils should uncritically absorb the food industry's activities. Food technology builds on the traditional view that the subject should enable pupils to become discerning decision makers and consumers…' (ibid: 7). Unfortunately, these grand claims for the value and purpose of the subject were never fully realised as there has been little teaching about the wider issues of food (Rutland and Owen-Jackson 2012a, 2015b).

In the 2000 version of the NC its purpose was stated as 'promoting a certain kind of society…cultivating citizens of an appropriate sort' (White 2004: 5). There was also much discussion about the growing 'knowledge economy' and the need for 'soft skills', such as communication, team work, problem-solving. Seltzer and Bentley (1999) suggested that this would require an education based on practice rather than content, exactly what D&T was doing, or at least was intended to do and was doing in schools where good practice was found. With schooling now focussed on preparing young people for life and work (Greany and Jones 2005) D&T was seen by some as making a valuable contribution to this aim, David Hargreaves suggesting the subject could become 'the heart of the school curriculum…and an exemplar for other subjects in delivering effective teaching and learning' (Kimbell and Perry 2001: 1).

A DfES/DTI report (2006) on science, technology, engineering and mathematics (STEM) aimed to encourage more pupils to study these subjects in order to increase STEM-literacy in the general population and encourage more to go into STEM-related careers (deemed important for developing Britain's economy). This could have been a great opportunity for D&T, and food technology, to really show and develop its links with science and technology but the focus of much STEM work has been on science and mathematics with little attention paid to technology and engineering (Barlex, 2011).

Food education has become more of a priority as the UK government is increasingly concerned about high levels of childhood obesity. Some seem to believe that teaching children 'cooking skills' will allow them to make healthy food choices and so lead to a reduction in obesity, yet it is known (Hashem 2014) that there are multiple and complex factors that contribute to obesity, for example socio-economic conditions and the availability and accessibility to food. Similarly, McGowan et.al. (2015) noted that there is limited dietary change related to the association between domestic cooking skills and food skills and that other psychological components (e.g. attitudes) and external barriers (e.g. budget, access to equipment, food storage, etc) need to be taken into account. Ignoring these complexities, in the 2013 revision to the National Curriculum the government put 'cooking' back onto the school curriculum, ostensibly alongside food technology but with dwindling time and resources available it is possible that food technology will eventually disappear and pupils will be left learning only the practical skills.

Undeniably, there is some poor teaching of food technology in schools, as there is in other subjects. One of the reasons for the variable quality of pupils' experiences may be the lack of suitably qualified teachers; there have been various reports (Ofsted 2002, 2008; QCA 2005) highlighting this issue. It has also been noted that the teaching of food is compromised by shortages in resources, for example accommodation, specialist equipment and curriculum time (Ofsted 2005). Teachers also report (Rutland and Owen-Jackson 2012a) shorter lesson times, making the integration of practical work with theoretical understanding more challenging, and lack of technician support, leaving teachers with a heavier workload. As Rutland (2013: 20) notes '…it is not 'food technology' itself that is letting down students, rather the way that the subject is understood and taught in some schools'. It is also acknowledged, however, that some food teachers remain reluctant to teach the food science aspects of food technology, whether because of their own lack of food science knowledge or that they do not see its relevance. An attempt to bring together food and science teachers proved unsuccessful as it served to highlight the different understandings of knowledge in the two disciplines and the different pedagogical approaches (see Lewis et.al 2007).

Given the difficulties facing the subject, and the criticisms it has endured, it has to be asked if there is a future for food technology in the school curriculum.

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Is there a future for food technology in the school curriculum?

Food was introduced in the school curriculum in order to help improve the health of the lower classes and to prepare girls for their role in society, whilst it fulfilled this purpose at the time this is no longer appropriate. The subject was then adapted to help prepare girls and boys for adult life and for work, and in the main it fulfilled this role. More recently, changes to the subject focusing on 'developing cooking skills' were intended to help pupils develop healthy diets and lifestyles but it seems to have failed in this (Haslem, 2014; McGowan et al, 2015). If food cannot meet the political objectives set for it, then does it have a future in the school curriculum? The answer to this question depends to some extent on how food technology is defined.

In 1978 a government document (DES 1978) described home economics as a subject which 'combines knowledge drawn from the sciences and arts and applies it to experiences which pupils can relate directly to their own lives…[to] give meaning and reality to theoretical work' and which has 'strong links with science and contributes to scientific thinking, understanding and skills' as well as developing mathematical understanding, language and 'ethical, social and political' learning. It described the skills that could be learnt through the subject, including manipulative dexterity, social skills, sensory skills, organisation and management, communication, teamwork and independence. The subject, it suggested, offered opportunities for teaching which included 'investigation and problem solving' (ibid). Similarly, Kimbell et.al (1991:22) describe capability in D&T as the 'active, purposeful deployment of understanding and skills, not just their passive demonstration' and research (Harris and Wilson 2003: x) has found that 'D&T does provide opportunities for pupils to develop high order thinking skills and problem solving skills, but … overemphasis on product outcomes and 'coaching' for public examinations hinders cognitive development.'

Research by Rutland and Owen-Jackson (2015b) reported on pupils' views and experiences of food technology. They found that pupils' expectations are that food technology will teach them to cook and prepare them for a career in catering but they are unaware of the wider possibilities offered by a broader understanding of food and its related issues. Pupils choose to study food technology mainly because they are interested in food and to learn practical skills. Whilst practical work is of value pupils, especially at GCSE level, do not appear to appreciate that food technology also includes nutrition and food science. There seems to be limited interest in studying food technology as preparation for a career; at GCSE level 7% want to work in nutrition/dietetics, 6% in catering and 6% in science. At A-level, where there is usually a correlation between the subjects studied and career or higher education aspirations, it is surprising that only 2% refer to work in nutrition/dietetics. In Rutland and Owen-Jackson's study (2015) those pupils who expressed an interest in a food-related career referred mainly to catering work, and their lack of science subjects would limit their opportunities within the food industry. The food and drink industry in the UK is one of the largest manufacturing sectors, employing 16% of the manufacturing workforce and accounting for 18% of manufacturing output in the UK, yet pupils seem unaware of the possibilities of careers. The Director of the Chilled Food Association has commented that 'The ever-deepening UK skills shortage in food science needs to be addressed to sustain UK industry. We need young people to be inspired, informed and enthused in food-related subjects early in their school life. We are aiming for more science in food teaching and more food in science teaching.' (Goodburn, 2013: 2). Unfortunately, developments in England do not seem to be supporting this.

The new GCSE examination, Food Preparation and Nutrition, attempts to cover both general and vocational aspects of food education and the 'life skill' of cooking. The examination will prepare pupils to cook food at home and for work in the catering industry but will not prepare them for other food-related academic careers. There is a wide range of roles in the food industry, at all levels, but this GCSE content will not prepare pupils for the technical and scientific routes into higher education or employment. There is already a shortage of suitably-qualified personnel (Goodburn 2013) and the revised GCSE examination and lack of A-level examination in the subject will impact on undergraduate provision and further exacerbate the current shortage. The problem is compounded by the impact on teacher supply, 'why would anyone with a food related degree want to become a teacher who just taught cooking and nutrition?' (Rutland, dt-itt-googlegroups.com 15th October 2014).

Whilst food technology within D&T initially helped to locate the subject as one concerned with the modern world, innovative and continually developing, the constraints of meeting requirements that suit all material areas distorted what was taught and led to some of the difficulties that the subject has experienced. In our view, there are alternative positions. Food studies could be within the science curriculum, but this might also lead to constraints on content and pedagogy. It could sit within humanities;

history, geography and RE have managed to retain their individual identities under the 'humanities' umbrella and food could do the same (Owen-Jackson, dt-itt-googlegroups.com 15th February 2015). However, it should still be taught by food technology teachers as the content needs to include practical work, it is this aspect of the subject that helps to make the theoretical underpinning more relevant, interesting and accessible.

It seems likely that food will remain in the school curriculum. Currently the focus of food teaching is on the practical, life skills, aspects but we hope that in the future the teaching of food will extend so that the practical skills are taught with the supporting understanding of food science, nutrition and the wider social, ethical and political issues around food. In order for this to happen we believe that there needs to be more discussion about the purpose of education and the subjects on the curriculum. Lambert (2004: 79) is critical of the school curriculum, suggesting that it becomes 'stuck' and 'increasingly disengaged from both the wider discipline and the lived experience of the teacher and students', although writing about geography his comment applies equally to D&T. Those engaged in D&T education agree, one teacher educator suggesting 'we need to establish a forum and agenda for the reconceptualisation, justification and modernisation of the design & technology curriculum just as the science community did in the late 1990s' (Barlex, dt-itt-googlegroups.com 18th February 2013).

Conclusion

Our review of the literature, and our research over the last 10 years, has shown that schooling is political and, from its inception, food teaching in school has been used for political purposes, from preparing girls for their future roles to addressing the health concerns of the nation. Yet the literature also shows that the study of food can be much more than this. In 1978, the Department for Education and Science itself noted that home economics was important because it related to pupils lives and that it could contribute to their scientific learning as well as developing their understanding of ethical, social and political issues (DES 1978). The current teaching of food has narrowed the focus but it is our view that this needs to be reconsidered and that:

> There is a need for the clarification of course content and for examination courses to be more intellectually challenging and designed to meet the needs of three distinct groups of pupils: those intending to go onto higher education in food studies, those wanting careers in hospitality and catering and those wanting careers in nutrition and dietetics. Pupils wanting to learn to cook and develop 'life skills' could be offered courses which sit outside of the school examination curriculum. Food education has an important remit in the twenty first century and courses should be available in schools to meet all pupils' needs and aspirations. (Rutland and Owen-Jackson 2015: 9)

This will not be easy, addressing the challenges of getting modern, worthwhile, food education in the school curriculum requires the engagement of many within the food community. We suggest that those in industry need to lobby for the review of the curriculum and examinations to ensure that the subject content supports not only those wanting to learn practical skills or work in catering but also those interested in food science and technology and food production. In addition, the government should engage in a robust dialogue with the food industry regarding their food products, their potential impact on the health and well- being of their customers and the extent to which the industry is adopting an ethical approach to food product development.

We also think that discussion needs to take place between Awarding Bodies and universities to identify what would be acceptable in an A-level food-related course for university entry. Whilst science and mathematics A-levels should be necessary for food science and technology related degrees, candidates with a better understanding of food would have more to offer and provide considerable benefits to the food industry. An appropriate food-related A-level would also prepare those wanting to work in the food industry at technician level or careers in which food knowledge would be beneficial, for example childcare, social work, some medical careers. An A-level which teaches about food, food science and related issues could be a useful asset in many careers.

Teachers themselves need to be prepared to scrutinise the subject and be clear about what their pupils can learn from studying food – whatever its label – beyond the important practical skills, and how this learning can be achieved.

We agree with Goodburn (2013: 2) that 'Food technology education must be more than just cooking'. It is our view that teaching about food in the school curriculum is more than the transmission of practical skills or preparing young people for work in the food industry, it should ensure that our children become informed and responsible consumers of food. Current research outlined in this paper has shown that food teaching has the potential to be a vehicle for informing and enriching the lives of children in the 21st century in practical, intellectual and social domains.

Food in the school curriculum in England: Its development from cookery to cookery

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