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### Abstract

This article is an abridged version of an assignment submitted for an MA Module in ICT in Education in 1998. As part of a drive to introduce and make ICT an intrinsic element of classroom teaching in food technology, three in-service sessions were organised and delivered in collaboration with any inspector for design and technology in a Local Education Authority (LEA). The rationale for the in-service was to address key issues identified on inspections concerning the use, or apparent lack of ICT, in many material areas of design and technology. These included computer anxiety, resistance to ICT and making ICT relevant to the curriculum area.

### Food technology in-service

In consultation with the LEA inspector, a course outline was agreed with aims, description and learning outcomes.

### Course aims

To investigate the role of ICT in food technology, identifying techniques used in industry that can be emulated in the classroom to enhance design and technology work.

### Course description

The course will focus on using ICT to enhance design and technology work. It will look closely at industrial practice, and how this may be used as a starting point in school. A mixture of formal presentations and hands-on sessions will be used. Arrangements will be flexible to cater for a range of previous experiences.

### Learning outcomes

- Increased awareness of the role of ICT in the food industry.
- Focused use of ICT to enhance student outcomes.
- Experience with ICT applications/tasks to apply in the classroom.
- Consideration of the integrated role of ICT in food technology activities.

### The in-service session

The course was presented in an ICT room within a teachers' centre. A maximum of 12 delegates attended each day session and a computer technician was on call. All delegates had use of a networked PC computer and a range of peripherals at their disposal.

Within the introduction of the course, many delegates expressed their anxiety of using ICT in food technology – with the outcome being that previous experience was minimal. The teachers' expectations of the day were to gain

new ideas to use back in the classroom, to become familiar with one or two new software packages and to have the chance to 'play' with the computers in a non-threatening environment. The last point was particularly important to many of the teachers, as within the school, they wanted to be seen as being confident in using ICT with pupils. This sense of security, to experiment with ICT in a safe non-threatening environment, was one of the factors the inspector wanted to incorporate through the in-service provision, and is an element Crookall (1987) suggests is of paramount importance in any in-service.

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### Teachers value the opportunity “to experiment with ICT in a safe non-threatening environment”.

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The programme for the day was devised to meet the course aims and learning outcomes, giving delegates a mixture of didactic presentations about the role of ICT, i.e. why use ICT in food technology, and practical hands-on sessions, i.e. putting the theory into practice. Handouts and classroom case studies supported the presentation on the role and use of ICT in food technology. The idea of the session was to set the scene for the day, introduce concepts about the possibilities and potential of ICT through the National Curriculum, show industrial applications and implementation strategies for use back at school.

The focus on industrial applications of ICT was poignant to the session, as in GCSE syllabi this context is explored in detail. Pupils are expected to show how these concepts could be emulated into their own GCSE coursework. ICT, in this context, offers practical techniques that can be successfully emulated in the classroom, e.g. modelling. Each type of task, for example costing or Internet use, was presented to the whole group. This allowed discussion about incorporation of ICT elements into schemes of work, organisation concerns and classroom management. These themes follow the NCET (1995) document guidelines concerning training teachers in ICT.

The practical hands-on tasks were firstly introduced to the whole group, then through task booklets for individual study. The booklets were produced from previous in-service sessions and excerpts from articles concerning ICT and Food Technology. (Ballam, 1995a, 1995b, 1996a, 1996b, 1998) For example, one of the tasks teachers asked to go through as a group was the use of a spreadsheet application, e.g. Excel, to model

and present sensory evaluation results. To make the experience as realistic to the school setting as possible, food samples were made available for delegates to organise sensory evaluation tasting. The results from the tasting session were then analysed using Excel.

An essential part of this procedure is to allow pupils to model and examine changes that may be required for the sensory attributes of a food product. Allowing the pupils to bring ideas to the 'real world' and test them, i.e. manipulate the data in a number of different permutations. The Assessment of Performance Unit (APU) design and technology project concluded that modelling was at the crux of all practical activity, as it combines the human abilities for thought and action (Murray, 1994). The chance to practise this simple task, along with their peers on the day, allowed the teachers to see the relevance and opportunities of ICT and modelling open to them back at school. It showed that this task, which is performed by pupils throughout their food technology experience in school, could be easily implemented, allows rapid modelling of sensory attributes and enhances the quality of work.

The programme continued, through the work booklets, allowing teachers to specialise, if appropriate, on skills that would be of use to them. Continually the theme of application of the in-service sessions in schools was raised. Work continued throughout the day, allowing time for informal discussion and debate on the merits of each task. Areas covered included:

- sensory evaluation – using spreadsheet application
- costing – using spreadsheet application
- nutritional analysis – using 'EatMeter', a simple nutritional analysis program, to model (calculate) the nutrient profile of a number of food products
- flatbed scanner – for disassembly and quality control work, e.g. analysis of gluten formation of a number of bread samples
- digital camera – for quality control and visual specification work, e.g. production of a visual flow chart for assembly of a product
- Internet use – to assess research and e-mail capabilities, covering areas of logging-on, use of search engines and e-mail.

#### Evaluation of the in-service course

The in-service course evaluation, from responses by teachers, revealed that they found the courses extremely useful. From the 28 teachers who attended, only one commented that the course had only 'partly' met the aims of the day and had been personally useful. Although this is encouraging, it does suggest that there is little in the way of in-service material or courses for teachers to choose and critically evaluate for their own needs.

The delegates were asked what they hoped to achieve from the in-service sessions. The responses were dramatically similar, with the following criteria being the most common:

- to increase confidence
- improve knowledge of ICT
- gain ideas to use back at school
- to become up-to-date with current developments.

These aims and teachers' informal comments throughout the day indicated a high level of anxiety about using computers. However, teachers had to apply to attend the in-service training, so one could assume a certain element of personal motivation and desire to become more competent with ICT in the classroom.

When asked whether the aims of the course were fulfilled, including meeting their own personal objectives for the day, the reports were extremely positive. Teachers commented on the balance of information in relation to practical experience as being one of the high-points of the in-service training. This element was described by one teacher as 'good information with help for its application in the classroom'. The mixture of theory and practical tasks seems to have been one of the factors in its success. Comments such as, 'chance to experiment' and 'chance for hands-on practise with ICT' both clearly show that teachers value the time, support and ideas during in-service sessions to enable them to explore ICT in relation to their own curriculum areas.

Underwood (1997) supports this analysis, suggesting that the fundamental reason for lack of progress, despite numerous initiatives in ICT in the school curriculum, is the inherent resistance to change within the profession. And that if change is to be brought about through experience, as was the aim of these in-service sessions, it must be meaningful in both a personal and practical way to the teacher. This point, in light of teachers' comments, was met. However, even though the practical element was seen as

beneficial, one teacher suggested that the practical experiences were frustrating.

This may be exemplified through the use of the Internet during the sessions. Although teachers saw the potential, and commented on some of the benefits for using the Internet with pupils, it was exceedingly frustrating to many of them, as it was not realistic back at school to implement. The obstacles were seen as the physical location of the Internet link (if the school had a link), only one pupil could use the Internet at once, and cost. This feeling of frustration was remarked on by Schrum (1995) in a study of adult learners and the Internet. As with the teachers present at these in-service sessions, the adults were excited and enthusiastic about the Internet, yet back at school obstacles interfered with their new skills.

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Teacher evaluative comments also indicated that the information concerning the role of ICT was simply presented, that a range of food technology uses with ICT were identified and the tasks were clear enough for pupil use. It was also evident that most teachers felt more confident using ICT at the end of each session, with one teacher stating ‘I feel that I can now cope’. This feeling of increased confidence from completing an ICT in-service course, despite obstacles which may be faced by the teacher back at school, is well documented. It is the coming to terms with unfamiliar jargon, confronting ignorance and elements of computer phobia that enhance the teacher’s own confidence with ICT (Kennewell, 1992 Kempson, 1991 Faseyitan *et al.*, 1996).

#### **Confusion over modelling**

However, the term ‘modelling’ lead to misunderstanding amongst many of the teachers present, with the adoption of it being a means to an end, rather than an intrinsic part of the overall process. Its place within the context of the task was not reflected upon. Clearly an opportunity to explore the use of modelling, leading to a conceptual understanding of its place in a problem-solving context, could be introduced. Murray suggests that teachers should question whether the outcome of modelling is the most important element, at the expense of the process itself (Murray, 1994). Provision for this type of reflective analysis within teaching

could be built into future in-service training sessions. However, as previously stated, Herterich (1990) suggests that courses should be vocationally based towards the needs of the teacher, rather than meeting idealised academic requirements.

Stevenson suggests that the perception of modelling reported by the teachers is due to a number of factors brought around as a consequence of establishing it as a concept in the National Curriculum. Firstly, modelling was largely unknown to most teachers. With the addition of modelling in the ICT Orders, it added another novelty, that of computers. And lastly, on a personal level, it provoked anxiety amongst many teachers and created demand for in-service training (Stevenson, 1994).

#### **The training day**

A majority of teachers suggested that the key factor to improving the course would be to allow more time – perhaps by extending the session by another day. However, when this was mentioned in the plenary session, teachers commented that on reflection it would be unrealistic to school management, in terms of time and money, to allow them to attend a two day ICT course. The proposal of running long term courses is not new. However, as Heppell (1988) argues, the GRIST (grant related in-service training) in-depth training courses were developed to meet such a need, yet ended up being run in twilight hours by dedicated lecturers for tired staff, due to lack of co-operation from LEAs and school management.

Other factors for course improvement included being able to take examples of work back to school on disk, devising units of work, working with control technology and participating in sessions exploring the use of ICT with pupils with special educational needs. One teacher also requested that schools should be sent a questionnaire in advance to assess their training needs. This was not initiated for these courses, yet would be advisable for future sessions as teachers’ ICT skills, knowledge and understanding were variable. Clemente (1991) identifies this as one of the factors for effective in-service training. It may be that separate courses for different abilities and experiences should be offered – thereby encouraging use of ICT with the ‘computer phobic’ and providing a challenging environment for the more competent user.

Overall, the feedback and responses from teachers on the courses was encouraging. They clearly benefited from gaining an insight into the role of ICT in education, and then having time, within a non-threatening

environment, to explore and practise ICT related focused tasks to food technology projects.

### Conclusion

Within the limitations of this assignment, it is hoped that an overview of the development of in-service training sessions for food technology specialists has been given. Rationales for ICT and its current role in education have been identified and discussed in relation to current curriculum needs and opportunities.

Through the process of running training and completing this MA module, one questions the mode of training selected, and whether modifications to the courses could be addressed next time. For example, enabling teachers to understand the relevance of computers in learning and exploring the concept of modelling in depth, rather than offering a simplistic overview of what can be achieved.

The experience also enables one to evaluate the training and take a 'step back' to review ICT within a broader context, rather than as one teacher in a classroom. For example, reflection and analysis of the issues prevalent to food technology ICT training needs lead to the production of an article for the Design and Technology Association (DATA). It explored the use of ICT in relation to modelling, imaging, data logging and communicating, illustrating why ICT may be desirable for inclusion in some aspects of work. Some of the work suggested being deliberately challenging for teachers and for some in advance of current practice (Ballam, 1998).

It may, on reflection, be of use to continue research into in-service provision, by implementing more long-term investigative strategies. For example, a follow up study critiquing current use of ICT, by teachers who attended the three training sessions, could clarify whether the skills, knowledge and confidence gained from the courses on the day, were being implemented. One area of concern identified was the availability of in-service training and practical resources to support teachers with the integration of ICT into their curriculum area. Work could be carried out to assess needs, and produce training materials to support and enhance ICT development and pupil capability, perhaps through case studies and worksheets.

Analysis of in-service courses suggests that change, in relation to ICT uses, depends partly on the willingness of the teacher to learn new skills and adapt teaching styles. Pedagogical change, Cox argues, will only come about when policies and practices in the

education institution as a whole support ICT training, from ITT through to continuing professional development (Cox, 1997). Critically, this view for change in implementing pedagogical practice, is suggested after 30 years of ICT in education in the UK.

A commentary in the *Times Educational Supplement* of the BETT '98 exhibition, an annual educational ICT event, summarises the position of ICT use in the UK in one sentence – 'no matter how good the hardware, the software and the linking technology, if we mere mortals still lack the skills to cope with them, then the fanciest learning network in the world will always deliver less than it promises' (Wilce, 1998). With this in mind, it poses the question: can ICT training be sidelined for another 30 years?

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