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TECHNOLOGY FOR ALL - A CURRICULUM DEVELOPMENT INITIATIVE IN THE NORTH WEST TVEI LEA's

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It is necessary at this stage to point out that the outcomes of this project are due to the hard work and efforts of teachers in North West LEA's who voluntarily gave their time and expertise. This short paper is an attempt to share with colleagues some of the results of this work.

INTRODUCTION

This initiative grew out of the shared concerns of North West LEA's in 1987, as they prepared to make proposals to move from the pilot phase of TVEI to a full extension, announced in the 1986 white paper 'Education and Training Working Together'. A key requirement was that LEA proposals should be specific with regard to the provision of Technology for all pupils 14-16.

Early proposals highlighted a number of concerns and difficulties for schools and LEA's. These include:

a. the lack of an agreed conceptual framework for an entitlement in Technology.
b. the established courses in Technology for GCSE were demonstrably unattractive to girls and some boys.
c. the lack of experience in curriculum management of such provision for all 14-16 year old pupils.

The north west TVEI group took this on as a curriculum development initiative, addressing the problems of definition of entitlement, of course development and of curriculum management. There was already experience of working together in respect of GCSE syllabus development, of production of teaching materials and of providing in-service courses for teachers. It was possible therefore to identify a team of key people and Technology For All (TFA) was launched in November, 1987.

MANAGEMENT AND ORGANISATION

The regional group of TVEI co-ordinators, advisers and officers were to act as a steering group and source of funding. One representative from each LEA was nominated to be on the Editorial Group. Expert practitioners were to be nominated by the TVEI co-ordinators to develop the support materials. One TVEI co-ordinator was to chair the editorial group and act as host for the project. A member of the University of Leeds TVEI evaluation team was to provide the external report.
Objectives:

To produce

(a) an explanation of "Technology Education".
(b) a proposed entitlement to Technology for all pupils 14-16.
(c) a proposed means of delivery in schools.
(d) a suggested management approach in schools.
(e) exemplar case studies.
(f) proposals for auditing the quality of this delivery in schools.
(g) teacher/learner support materials.
(h) an evaluation report.

Phasing

Objectives (a) to (f) would constitute Phase 1 of the project, to run from November 1987 to June 1988.

Objectives (g) and (h) would constitute Phase 2 and run from September 1988 to October 1989.

**PHASE 1**

The outcomes of phase one of the project are published in a North West development paper "Technology For All" (TFA) in the extension of TVEI the following is a summary of this publication.

The group considered the plethora of definitions for Technology and the one selected for the basis of this work is well known:

"Technology is a disciplined process of using scientific, human and material resources to achieve human purposes" (Project Technology 1970).

The diagram (fig 1) illustrates how process, resources and human purpose are linked in technological activity.

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**CONRAINTS**

eg. financial, the limits of knowledge, personal and social issues.

**HUMAN PURPOSE**

eg overcoming physical disability

**THE PROCESS OF TECHNOLOGY**

- Identify problem
- Propose solutions
- Choose the best
- Implement the practical design
- Test and compare with original purpose

**RESOURCES**

Creativity, experience, practical competence, facts, scientific principles and knowledge, materials etc.

**HUMAN ACHIEVEMENT**

making products or systems

eg. artificial limbs, electrically operated vehicles etc.

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*Project Technology (1970),*  Immodified with permission from Geoffrey Harrison.
A MODEL FOR MANAGING THE INTRODUCTION OF TECHNOLOGY FOR ALL

Why Technology for ALL?

Definition of Technology

Discuss Entitlement Statement

Agree

Disagree

Explain
Delivery Models

Modular

Stand alone projects
No allegiance to individual subjects or examinations

Structured courses
eg. CDT Leading to recognised public examinations.

Collaborative links
between subjects eg. Art, Business Studies, CDT, Home Economics, IT, Science, etc.

Discrete subject enrichment Isolated within single subjects

Analyse readiness of institution

Curriculum Audit

Staffing Audit

Resources and Timetable Audit

Accreditation Audit

Decide Policy

Delivery Models

INSET, Staffing and Coordination

Resourcing and Timetable flexibility

Accreditation and recording of competences

Plan Delivery

Teacher/Learner Support materials assessment schemes, Support agencies.

Development team and Inservice programme.

Resourcing and Timetable

Phased and sequenced targets over 5 years

Audit and Evaluate Whole staff involvement.

Fig. 2
The ability to apply this approach with confidence is called technological capability and the chief purpose of technology in the school curriculum is the progressive development of that capability. Its development is demonstrable in terms of:

a. personal resources of skills, knowledge and understanding of concepts.
b. practical competence in applying the above
c. an understanding or awareness of the limitations and consequences of technology.

The entitlement therefore, consists of developing, for each individual, the RESOURCE, the COMPETENCE, the command of PROCESS and the awareness which will lead to technological CAPABILITY. Since capability involves the practical application of learning, it cannot be developed without offering opportunities for work in a variety of contexts. It is an essential part of the entitlement therefore, to participate in the identification and solution to problems which arise from human needs and issues.

A. Management Model

TFA implies a major change, requiring typically:

i. 10% of the week for all 14-16 year old pupils
ii. interdepartmental co-operation in delivery and curriculum terms
iii. the development of staff who do not regard themselves as technology specialists
iv. the reorganisation of resources
v. improved assessment and recording processes

A systematic management approach is clearly needed.

The diagram (Fig 2) shows a model which has been developed and discussed at a number of conferences: it has validity at both institutional and LEA level. It is recommended that Advisers, Co-ordinators and Head Teachers engage colleagues in the whole process.

TFA Delivery Models

The management diagram (Fig 2) shows the five principal models which have been recognised as vehicles for the delivery of Technology.

A. Stand alone projects
B. Structured Course
C. Collaborative links between subjects
D. Discrete subject enrichment
E. Modular approach

Additionally, elements of these can be structured in a modular form to provide a coherent course.

Technology Audits

The effective delivery cannot be achieved without a perception of the cross-curricular dimension of TFA and without an understanding of the strengths of a school, in terms of its curriculum, staffing and resource provision. This process is indicated in the lower half of the management model (Fig 2).

Following this general understanding of institutional readiness, head teachers may wish to construct a more detailed audit in order to highlight areas for staff development and to help avoid duplication or replication in the curriculum. Audits for curriculum and staffing have been developed to assist this process. These are not exhaustive and schools may well wish to tailor the questions to better fit their own institutions.
PHASE 2

The north west TFA groups have now embarked upon the second phase of development to provide teacher/leaver materials. It is envisaged that these materials will:

i produce technological assignments in a variety of curriculum areas.

ii audit that part of the technological entitlement which the assignments meet. Each assignment will be accompanied by a set of completed audit grids.

iii show how assignments can be located within existing GCSE subjects.

iv propose a coherent course in Technology which is compatible with the recommendation of the National Curriculum Working Party for Design and Technology.

The early stages of this work have been completed in that the teacher/learner materials have been written and trialled in schools. They are now in the process of being revised and polished for publication early in the autumn term.

In respect of the National Curriculum proposals, the regional editorial group will be revising the format of the Audit instruments to reflect the new proposals.