Technical Education in Scotland – Fit for Purpose?

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Abstract

As Technical education strains to find a niche in the educational market place, are teachers suffering from a crisis of confidence? How comfortable are they with the ever-changing curriculum, with the subjects they are teaching and the reasons why they are teaching them? The broadening of the Technical curriculum to include Practical Craft Skills has proved popular with teachers, particularly those who have been teaching for a number of years. The skills based nature of Practical Craft Skills has been promoted as providing opportunities for pupils who are unwilling or unable to engage in the design activity associated with Craft and Design as well as preparing them for modern apprenticeships. This paper explores the present state of Technical Education in Scotland, its role within the wider curriculum and its links with modern apprenticeships for Scotland's manufacturing sector.

Introduction

The role of Technical education is often described in vocational terms, with pupils being provided with knowledge and a skills platform for focused career choices. These career choices are typically promoted as being craft and technician status jobs within an engineering environment. Policy makers espouse a core curriculum that is supported by 'vocational training' (Scottish Executive 2003a), which is designed to fit the needs of the individual learner. Within this context, the Scottish Executive's push to develop an enterprise culture that engenders a spirit of entrepreneurship among young people (Scottish Executive, 2003a, b, c) may be laudable, but raises the question; where does the Technical curriculum sit in relation to this aspiration and are the skills and knowledge promoted by Technical subjects exploited appropriately by industry and higher education?

The premise that Technical education in Scotland has developed as a response to society's need for a technologically literate population (HMI, 1999) is a justifiable one in terms of curriculum development and its promotion of intellectual and practical skills. It has however proved a difficult exercise to promote Technical subjects (see Table 1) as offering more than vocational training for non-academic pupils. These authors would argue that the perception of Technical Education as a provider of training in preparation for employment through apprenticeships is outdated in relation to the current Technical curriculum. Somewhat disappointingly however, this perception remains largely unchallenged, and is in actual fact often promoted by Technical teachers themselves.

Technical Education in Scotland - Subjects	
	Course Aims (Source: SQA Course Arrangement Documents)
Craft and Design	The aims of the course (at Higher level) are to: • foster understanding of the process of designing in a commercial context and the factors which influence designs • enhance knowledge of industrial manufacturing processes and materials • increase awareness of economic considerations and the social implications of design and manufacture • develop skills in designing related to the industrial context • contribute to personal development, in particular to technological capability.
Graphic Communication	The aims of the course (at Higher level) are to: • develop aspects of technological capability • develop technological creativity in relation to selecting information and evaluating its appropriateness for graphic communication • develop an ability to read and interpret a range of drawings and information presented graphically • develop a technological perspective on the role of graphic communication in an industrial context • develop an ability to communicate graphical information using both manual and computer graphic skills and techniques • develop a knowledge of appropriate computer hardware and software for graphic communication and its related industrial applications • develop technological confidence in planning and implementing a graphic presentation on a theme, using appropriate samples from a range of manual and computer graphic skills and techniques.
Practical Craft Skills	The aims of this course (at Intermediate 2 level) are to: • foster practical skills in the creation of artefacts • develop knowledge, understanding and skills of general aspects of practical engineering/woodworking activity • encourage independence and the ability to make choices • highlight the importance of safety and encourages responsible attitudes in the workshop environment • contribute to personal development, in particular to practical capability.
Product Design	The aims of the Course (at Higher Level) are to develop: • the ability to produce solutions to design tasks by applying knowledge, understanding and problem solving skills • knowledge and understanding of the process and principles of designing • the ability to analyse and clarify problems in a design context • an understanding of the issues which influence the design of products • the application of effective graphic and modelling techniques • knowledge and understanding of industrial manufacturing processes and materials • the ability to effectively communicate and justify solutions to design tasks • an understanding of economic considerations, and the social and environmental implications of design and manufacture • and prepare candidates for further study of product design and manufacture.
Technological Studies	The aims of the course (at Higher level) are to: • develop an appreciation of selected key issues in technology, such as the environment, the contexts in which these key issues may be viewed and the constraints within which solutions or designs must be achieved • instil a knowledge of physical principles and of technology and commercial methodologies, and to apply them to solving problems or meeting specifications • encourage development of each candidate's communication and presentation skills • inculcate a receptive attitude towards technological progress and its demands • foster the ability to seek out, research, analyse and apply such information as is necessary for the aims above • foster technologically sensitive attitudes.

Table 1

The Scottish Executive's identification of core skills (see Table 2) that are central to its National Qualifications strategy is one that should be welcomed by Technical departments, since most, if not all of the core skills identified are widely promoted within the Technical suite of subjects.

Scottish Executive Education Department National Qualifications – Core Skills	
Communication	• Oral communication • Written communication
Numeracy	• Using graphical information • Using number
Problem Solving	• Critical thinking • Planning and organising • Reviewing and evaluating
Information Technology	• Using information technology o From accessing the basic facilities of a computer system to perform simple processing of familiar data and to select information from a local database to, o making effective, responsible and secure use of a computer system, using software in a context requiring some analysis and design, and retrieving information from a range of sources.
Working with Others	• Working with Others o Taking allocated responsibility for tasks, seeking or providing information from/to others as required, and reviewing their own contribution, to o Analysing tasks and negotiating goals, roles and responsibilities, anticipating and responding to the needs of others, and evaluating the effectiveness of their own contribution.

Table 2

The demand for high quality generic skills as outlined in the core skills is mirrored in the employability template developed by the Confederation of British Industry (CBI, Scotland, 2003) which outlines the attributes that they value in employees (Table 3).

Confederation of British Industry, CBI Scotland – Employability Template
1. Attitudes compatible with enterprise and work opportunities.
2. Values such as honesty, personal integrity and a regard for others.
3. The basic skills of literacy and basic numeracy.
4. The defined core skills of communication, numeracy, IT, working with others and problem solving aligned to the needs of employers.
5. Customer service skills.
6. Relevant job specific skills and knowledge.
7. The ability to manage one's own career.

Table 3

A strong and credible case could be made for Technical subjects as providers of the generic skills set promoted by the Scottish Executive and CBI, Scotland. In particular, it could be argued that Craft and Design (now being replaced by Product Design) and Technological Studies provide a rich intellectual experience for pupils, requiring

problem solving, communication, teamwork, negotiation and pragmatism through a number of levels of interaction between pupils and teacher. The rich cognitive learning experience provided through active learning and reflection, as evidenced through the research of de Miranda (2004), goes some way in demonstrating the inherent value of these subjects. When placed alongside the more skills based Graphic Communication and Practical Craft Skills, Technical departments can be seen to offer a range of subjects that encompass both academic rigour and practical skills development.

The trend towards a generic approach to the development of skills and knowledge has been mirrored in the development of the Technical curriculum offered in other countries (Jones, 2003), although many teachers would argue that curriculum development has not always been matched with appropriate support through staff development or rigorous consultation with stakeholders.

When comparing the uptake of subjects offered by Technical departments (SQA, 2003) we find that the largest growth area is in mainly skills based subjects within Technical departments (Graphic Communication, Engineering Craft Skills and Woodworking Skills). Table 4 demonstrates in particular the rapid growth of Engineering Craft Skills and Woodworking Skills, which fall under the banner of Practical Craft Skills.

Subject Uptake from 2000 to 2002 (Standard Grade/Intermediate 1*)	% Change 2000 to 2002
Craft and Design	+8%
Graphic Communication	+23%
Technological Studies	-17%
Engineering Craft Skills*	+66%
Woodworking Skills*	+114%

Table 4

The 17% reduction in uptake of Technological Studies is particularly worrying. When compared with other subjects such as Physics, which had a modest 2% increase in uptake over the same period, we get the picture of a subject that has failed to make an impact on pupils' subject choices. This may, in part be down to a lack of recognition of the academic rigour demanded by the subject among universities when compared with Physics (Canavan & Doughty, 1998) although teachers' own perceptions offer a broader picture. When a sample of 58 practising teachers throughout Scotland were asked to give their views on why Technological Studies was in decline, a number of reasons were given that implied a perceived difficulty of the subject, unfair competition with other subjects and lack of status afforded the subject. In particular, the sense of an uneasy relationship between Technical education and science subjects is an issue encountered in other secondary educational systems, as highlighted by Barlex and Pitt (2000).

Below, is a summary of practitioner statements:

"One of the main reasons is cross-curricular poaching from "core" traditional subjects like science."

"Influence and impact from those out with the subject, who are not aware of the relevance of the skills gained."

"...there is a cohort of teachers inside the department who actively sabotage the subject because they were poorly trained and would like it removed so they don't have to teach it."

"It is far too theoretical, academic, mathematical etc."

"Wrong pupil groups targeted. Pupils steered into an academic subject by those who thought that if its in Technical then it must have very little academic requirement. This leads to pupils being unable to understand complex electronics and mechanical problems.

"The subject choices available to better pupils disqualifies them from choosing this subject. The subject is not given a high enough profile in most schools."

The perception of Technological Studies being too difficult for pupils is one that is held by a fair proportion of Technical teachers within the survey. Table 5 indicates that a considerable percentage (25%) of staff held the view that Technological Studies was too hard for pupils, with another 27% of respondents maintaining a neutral view. These figures, it may be assumed reflect the type of pupil who chose to take Technological Studies.

Technological Studies is too hard for pupils.

	Frequency	Valid Percent
Strongly disagree	4	7.1
Disagree	23	41.1
Neutral	15	26.8
Agree	11	19.6
Strongly agree	3	5.4
Total respondents	**56**	

Table 5

A deeper analysis of the issue of perceived difficulty of Technological Studies indicates a disparity of perception that can be linked to length in service. Table 6 shows a strong positive correlation between length in service and perception of difficulty of Technological Studies, indicating that longer serving staff are more likely to consider the subject as being too hard for pupils.

Comparison of Length in Service and Perceived Difficulty of Technological Studies

		Technological Studies is too hard for pupils.
How long have you been teaching?	Correlation Coefficient	.358**
	Significance (1-tailed)	.003
	Sample size	56

**. Correlation is significant at the .01 level (1-tailed).

Table 6

This finding may additionally allude to a number of issues relating to length in service such as, in-service provision for staff, teacher confidence in delivering Technological Studies, cost of resourcing and subject preference agendas, which will be further exemplified in this paper.

Technical Subjects and Career Path

The development of the Technical education curriculum in Scotland (Bryce & Humes, 2000) from the 1970s to today has seen a shift from a primarily skills based model to the enquiry based model of today. This shift was largely driven in the late 1970s and 1980s through a number of initiatives, most prominently the Technical and Vocational Education Initiative (TVEI). The role of TVEI was to promote 'TVEI skills' (Devine et al, 1994), communicating, working individually and in teams, problem solving, taking responsibility, enterprise and using modern technology. An evaluation of TVEI (Doherty & Leven, 1998) highlighted the *'change in climate'*, and *'cultural shift'* achieved through the more focused and relevant *'work-oriented'* educational provision engendered in the initiative. Subsequent policy on the teaching of 'Technology' promoted by the Scottish Council for consultation on the Curriculum (SCCC, 1996) advocated the permeation of technology through the wider school curriculum.

These policy decisions have had implications for a number of stakeholders, each of whom have a part to play in defining the role of Technical education. These include:

- Policy makers
- Curriculum developers
- Teachers
- Parents
- Pupils
- Further and higher education

Whilst policy makers have endeavoured to promote a curriculum which encourages enterprise and employability, policy decisions may be influenced by short or medium term needs within the market place as well as economics. In recent years, the lack of skilled tradesmen at craft and technician level has been highlighted as being a problem of sufficient magnitude to require a greater emphasis on vocational subjects within the curriculum. To this end, subjects such as Practical Craft Skills have been promoted by some as offering pupils with an aspiration to go on to a craft or

technician apprenticeship with an opportunity to develop specific vocational skills within their secondary school experience.

This relationship between Technical subjects and in particular Practical Craft Skills and career path was explored through the examination of a number of major UK companies and training boards' requirements for school leavers wishing to embark on an engineering or construction apprenticeship. The results provide a disparate picture of the role of Technical subjects as preparation for craft and technician apprenticeships. Table 7 summarises the secondary qualification requirements in each instance. It should be noted that in some instances, only English GCSEs are indicated.

BAe Systems (British Aerospace)	**Technician Apprenticeship** 3 – 5 GCSE grades A to C (or equivalent) including English, Maths and a science. Craft Apprenticeship 3 – 5 GCSE grades A to E (or equivalent) in the same subjects. **Craft Apprenticeship*** at least three Standard Grades to level 3 which must include English, Maths and a Craft and Design/Technical subject.
BT (British Telecom)	a minimum of 3, 4 or 5 GCSE's at grade C or above (or equivalent), including English Language and Maths. Standard Grades 1, 2 or 3 in Scotland."
CITB (Construction Industry Training Board)	**Craft Apprenticeship** "Most people train and gain qualifications as they work, through an apprenticeship, although there are other kinds of training schemes. To enter the industry in a craft occupation, you will need a good basic education, Maths and English would be good." **Technician Apprenticeship** "To train in a technical occupation you'll need four good GCSE passes (or in Scotland, 4 good Standard grades), A levels or an equivalent vocational qualification."
AMEC Construction Services	Craft Apprenticeship (Carpentry/Joinery) 3 GCSE's or equivalent
OPITO (Offshore Petroleum Industry Training Organisation)	**Modern Apprenticeship** "A minimum of 4 Scottish Standard Grades at Level 3, in English, Maths and Physics/Chemistry/ Technological Studies, plus, if possible, subjects such as Craft & Design, and/or Computer Studies."
Weir Group PLC	**Craft Apprenticeship** Standard Grade at level '4' or above in Maths, English, Science subject and Technical subject **Technician Apprenticeship** Higher Grade Maths, Physics, Chemistry, English.
*Recent published requirements for recruitment specifically in Scotland	

Table 7

In general employers or training boards avoided a prescriptive approach to their qualification requirements for entrance to a craft or technician apprenticeship, particularly with regards to vocational qualifications. The key requirements were typically numeracy and literacy, coupled with a range of generic skills, such as communication, teamwork etc. The nature of most apprenticeships which entail some form of specialist further education through the Scottish Vocational Qualifications (SVQ) framework in large part led to employers being less reliant in specialist, vocational subjects at secondary school level and more interested in general indicators of ability coupled with numeracy and literacy.

Although Technical subjects were represented within some employers' requirements, it was noted that Practical Craft Skills was on no occasion specifically asked for. It was also noted that one employer differentiated between craft and technician apprenticeships in terms of subjects required, with science subjects taking precedence for technician apprenticeships. The reason given for this was the academic rigour of further educational courses that were allied to technician apprenticeships.

It appears from this survey that there is no solid relationship between Technical subjects and entrance to apprenticeships. In fact, it seems that for apprenticeships at technician level, there is a tendency to prefer sciences to Technical subjects. It can only be speculated that this is down to science's role in providing general measures of intellectual ability coupled with an historical predisposition towards the sciences.

Staff Perceptions of Technical Education and its Role

The role and status of Technical education and its constituent subjects was also explored through a survey of 58 practising teachers. Whilst there may be a strong cultural dimension to the lack of status afforded Technical education, the polarised picture created from teacher perceptions could be said to undermine the role and status of departments through an inability to develop and promote a coherent case for the curriculum on offer. Unlike most other subject areas, the Technical teacher is required to specialise in a number of certificated subjects. This has posed a longstanding challenge to initial teacher educational institutions that are required to develop competence over a diverse range of subject areas, as well as to practising teachers who may require support in the development of their own competence in line with curriculum development as highlighted by Jones (1998). It can also lead to a degree of subject 'cherry picking' along the lines of personal preference or practitioner confidence.

This is highlighted when considering teachers' perceptions of the subjects taught within Technical departments and the current direction of Technical education. Table 8 highlights the rise of Practical Craft Skills, with more respondents teaching this, the newest subject within the suite of Technical subjects than any other.

Subject	Number of Respondents Teaching Subject (Sample size: 58)
Craft and Design	51
Technological Studies	18
Graphic Communication	43
Practical Craft Skills	56

Table 8

The role of senior staff in defining and directing departments is an important one. The perceptions of these senior staff can therefore be crucial to the effective integration of curricular change as well as providing impetus for the wider promotion of Technical subjects. The degree to which the pace of curricular change has been a de-motivating factor among senior staff, coupled with the need for, and in some instances, resistance to professional development was investigated through consideration of length in service in relation to a number of perception-based variables. The analysis of the data indicates a fragmented and often polarised staff with multiple agendas based around personal preference subject confidence individual skills and knowledge. This is not surprising considering the shape and pace of change, however it once again, inadvertently creates the impression of a department which struggles for an identity and which lacks a coherent vision for itself.

Table 9 highlights the polarised perception of craft skills against design within the same subject (Craft and Design). Whilst the data shows a significantly positive correlation (Sig. 0.001) between length in service and confidence in ability to teach craft skills, the opposite was seen when comparing length in service with confidence in ability to teach design (Sig. 0.0002).

Comparison of Length in Service and Confidence in Teaching Craft/Design

		I am confident in my ability to teach craft skills effectively.	I am confident in my ability to teach design effectively.
How long have you been teaching?	Correlation Coefficient	.396**	-.454**
	Significance (1-tailed)	.001	.0002
	Sample size	58	57

**. Correlation is significant at the .01 level (1-tailed).

Table 9

When the data is considered in the context of curricular change, one gets a further indication of the unease experienced by longer serving staff at the drift towards a design-based curriculum. Table 10 shows a significant negative relationship (Sig. 0.008) between length in service and recent changes to the Craft and Design curriculum through the Higher Still initiative.

Comparison of Length in Service and Perception of Craft and Design Under Higher Still

		Under Higher Still, the structure of Craft and Design has changed for the better.
How long have you been teaching?	Correlation Coefficient	-.314**
	Significance (1-tailed)	.008
	Sample size	58

**. Correlation is significant at the .01 level (1-tailed).

Table 10

As well as exploring staff confidence in teaching craft skills and design, respondents were asked to indicate the degree to which they enjoyed teaching each element of the Craft and Design course (Table 11). The responses indicate that most staff enjoyed teaching the craft component, irrespective of length in service, although a strongly significant negative correlation (sig. 0.0004) was demonstrated between length in service and enjoyment in teaching design.

Comparison of Length in Service and Enjoyment in Teaching Craft/Design

		I enjoy teaching craft skills.	I enjoy teaching design.
How long have you been teaching?	Correlation Coefficient	.077	-.494**
	Significance (1-tailed)	.285	.00004
	Sample size	57	58

**. Correlation is significant at the .01 level (1-tailed).

Table 11

The analysis of data would indicate that the strategic policy that has led to change in the Craft and Design curriculum has failed to win universal staff approval. This may only be further exacerbated through the reinvention of Craft and Design as Product Design.

When Technical teachers were asked what they thought the major changes would be in Technical education over the next five years, clear evidence of conflict arose. In particular, staff resistance to design in favour of a return to craft skills figured prominently, with some predicting a return to a purely skills based curriculum. A number of statements have been deliberately included to give an insight into the depth of feeling. Respondent statements included:

"Move from Craft and Design to practical skills will continue."

"By the look of things there are moves to change craft and design to product design - removing all craft. This will kill Craft and Design off."

"Practical Craft Skills will take a more prominent role."

"That subjects currently taught will increasingly have a greater theoretical component. This would be a continuation of the slippery slope, which will not meet the needs of most pupils, nor of society and need to be resisted. E.g. the design component in Craft and Design is not popular and the overtly theoretical approach in Higher Home Economics has effectively killed it off. I am not advocating that we return to the days when pupils would construct, from scratch, a model steam engine, though it in itself it was a worthwhile exercise but that we do move with the times."

"There will be a move away from the amount of design back to a more vocational approach to craft as schools try to streamline the broadness of the curriculum. After all Art & Design already teach the design process."

"Some 'academic' schools will stop delivering Technology subjects, more 'vocational' schools will stop delivering Highers, though will embrace Practical Craft Skills at Standard Grade."

"More colouring and less craft."

"Technology has got to meet the needs of the wider world in giving pupils the correct introduction to the work environment. This should provide pupils with a more practical experience in technology departments."

"Introduction of Higher Practical Craft Skills, preferably with no design element."

"I think there will be a shift in the strongest subjects, previously Craft and Design has been the strongest subject in the school I am currently working, however more recently it has been Practical Craft Skills. This proves that fewer pupils have an interest in the actual design process."

"Craft and Design, I feel is a valuable subject but the design aspect is a waste of time in my view and the quicker it gets scrapped, the better. Pupils love the practical side, reading from drawings/plans and making the item. They have no concept or flare (the majority that is) for design and most teachers don't either. Personally, I hate the design parts of the course. Practical Craft Skills is a much preferred method of offering "hands on" practical work to the pupils."

"I really now feel we are at crossroads and certain steps need to be taken to ensure Technical Education remains as viable as it is now. Practical Craft Skills is in danger of swamping our subject."

Discussion

Technology provides a platform for much of society's cultural, economic and educational aspirations. To this extent, the role of Technical departments in providing a diversity of specialist vocational skills as well as a plethora of desirable generic skills such as communicating, problem solving and team working is one which is beyond doubt. So where does the problem lie with Technical education's status as a subject? Doolittle and Camp (1999) highlight the sociological complexities that link the curriculum and class structure. They also highlight the behaviourist underpinning of the traditional skills based Technical subjects. The fact that departments now offer

a rich, constructivist learning experience is one which is often lost within an environment of misrepresentation, inter-subject positioning, politicising and downright ignorance of Technical departments and the subjects taught within them.

The importance of Technical subjects as a key provider for apprenticeships in engineering can be misrepresented within the profession. Whilst the vocational nature of subjects such as Practical Craft Skills offer a valuable set of skills to any pupil, its relationship with modern apprenticeships could be regarded as tenuous at best. From the representative survey of teachers carried out, it can be seen that there are a number of agendas at play in driving the direction of Technical education. Worryingly, there seems to be a serious split among staff as to role of Technical departments; whether it be purely vocational, skills based or whether it should encompass the broader intellectual and philosophical learning more associated with Technological Studies and Craft and Design/Product Design.

Yeomans (1998) highlights the clear relationship between vocational education at post-compulsory level and career, much of which is carried out within the context of an apprenticeship that is tied to a course in further education. The fact that many vocational courses at further educational level are strongly supported by employers through apprenticeship schemes provides them with a relevance that is inherent. This same relationship is however not enjoyed by Technical education as most employers view vocational training as something which is largely covered within the structure of an apprenticeship.

The real problem with Technical education is still one of status and esteem. In this regard, the lack of status afforded Technical education, coupled with a fragmented and sometimes, destructive approach to the promotion of certain subjects causes concern for its future development.

One problem that has emerged from the restructuring of teaching staff duties and salaries has been the streamlining of line management within schools. This has changed radically from a system that promoted progression within departments through senior teacher, assistant principal teacher and principal teacher to one that will in some instances have a single head of faculty with responsibility for more than one department. This may lead to a decision-making environment that is disproportionately driven by individuals who, whilst having considerable service within the profession, may not have the appetite for curriculum development or indeed have little or no subject knowledge. Without sufficient incentives, it may also lead to a situation whereby experienced teachers, with no real scope for career development stagnate and remove themselves from the decision-making process which often drives curricular development. The case for devolved departmental decision-making is evidenced in the analysis of data described in this paper.

The evolutionary nature of Technical education necessitates a degree of almost constant curriculum change and that can be problematic. It is understandable that senior staff may wish to resist change through time, particularly if this change is not supported by appropriate provision for staff development or support from senior management teams. It is equally important however that teachers, entering the profession have the opportunity to work within an environment that nurtures them, values their skills and motivates them through inclusive decision-making.

A report on the state of Technical Education published by Her Majesty's Inspectorate of Schools (HMI, 1999) highlighted a number of recommendations for head teachers and departments to promote Technical Education. It concluded that head teachers and department should:

- *recognise and promote the contemporary relevance of technical education for the general and vocational education of all pupils;*
- *ensure an appropriate role for technical education at all stages in the school; and*
- *ensure that pupils, parents, guidance and senior promoted staff, local industry and commerce, and further education staff are fully informed about the nature, content and value of the various technical education subjects.*

The effective promotion of Technical education and its role, firstly requires that departments themselves recognise the intellectual relevance of Technical subjects beyond the development of hand skills if they are to challenge the stereotypical and sometimes prejudicial view of Technical as a haven for the educationally disenfranchised as exemplified by one statement recorded from practising teacher.

"Technical has an uphill struggle since the SMT (School Management Team) seem to see Technical as a depository for the disadvantaged and demented, not a place of education at all. These Neanderthals still see the Tech brigade as joiners, not really teachers at all."

Perhaps the most disconcerting aspect of this investigation into the role of Technical education in Scotland has been the difficulty encountered in pinning down a clear role in terms of career path or continuing education. This mirrors Hansen's (1997) observation that Technical education is being squeezed in an environment of, '*narrow conceptions of human development and the purposes of schooling.'* Whilst the skills offered by Technical subjects map effectively to the Scottish executive and industry's identified needs in terms of key skills, the virtues of Technical subjects still remain largely unheralded. Poor recognition of the suitability of some Technical subjects as entrance qualifications for a university degree has in the view of these authors accelerated the decline of Technological Studies as an academic subject. A similar fate could befall the new Product Design course unless it receives the support of higher educational establishments and staff alike. The polarised and agenda driven perceptions of teachers themselves, as identified within this paper do little to support the development of a coherent role for Technical departments. In a highly politicised educational environment, it is vital that Technical teachers develop a common and credible understanding of their role, if the status and merits of Technical subjects are to be successfully articulated.

The rationale for any education system should be the provision of opportunity to learn and to prosper through a career. In this regard, it could be said that Technical education is failing to define a role for itself through the intransigence of policy makers, higher educational establishments and some employers towards the knowledge and skills offered, coupled with an inconsistent and incoherent promotion of subjects from within the profession.

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