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THE DECISION TO UNDERTAKE VOCATIONAL HIGHER EDUCATION IN SHIPPING AND LOGISTICS IN THE UK

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**THE DECISION TO UNDERTAKE VOCATIONAL HIGHER EDUCATION IN
SHIPPING AND LOGISTICS IN THE UK**

by

JOHN DINWOODIE

A thesis submitted to the University of Plymouth
in partial fulfilment for the degree of

**DOCTOR OF PHILOSOPHY BY STAFF CANDIDATURE ON THE BASIS OF
PUBLISHED WORKS AT THE UNIVERSITY OF PLYMOUTH**

Institute of Marine Studies
Faculty of Science

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**THE DECISION TO UNDERTAKE VOCATIONAL HIGHER EDUCATION IN
SHIPPING AND LOGISTICS IN THE UK**

This work investigates the decision to study shipping and logistics at advanced levels in the UK. Documented evidence reports and analyses the perceptions of students on vocational courses in shipping, transport and logistics and investigates why they chose their particular fields of study.

A range of instruments are presented to analyse how students perceived that they had arrived at their study decisions, including national surveys of undergraduates in maritime business, postgraduates in shipping and logistics and professionals contemplating updating short courses. Qualitative, quantitative and mapping methods are presented along with perceptions of relevant professional outcome roles and other factors.

Exploratory approaches to proposing and evaluating alternative approaches to teaching aimed at raising the student's perception of the nature of professional skills requirements were predicated by identifying and defining local student schemae and tailoring aids to their specific learning and teaching requirements.

A cognitive mapping approach enabled comparisons of perceptions between postgraduates, whose individual beliefs, after being mapped and modelled as a directed network, were analysed, and differences between maps were quantified. Quantitative pairwise map comparisons included 54 individuals generating 1430 synchronal comparisons in one cohort and four diachronal cohort comparisons. These revealed that distance measures constrained by the numbers of transmitters or receivers, and the strength of relationships where appropriate, formed the best discriminators.

Empirical and theoretical explanations of maps and attempts to compare particular subgroups and explain differences were often inconclusive. A unified social cognitive theory of career and academic interest, choice and performance generated useful propositions relating to how individuals manage issues of self-efficacy, expected outcomes from decisions and their personal goals. Substantive work revealed problems of conflicting domains between students' verbatim statements, only weakly coincident with theoretical concepts. Conclusions that mapping is most powerful, when based on qualitative analysis of the richness and diversity of individual perceptions; infer that no simple standard decision process is operating and hence no single recruitment marketing device is apparent.

In applying and disseminating findings, where possible, proposals were made to assist organisations promoting careers awareness and recruitment into relevant professions and university based vocational courses, published by relevant professional bodies.

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Declaration

The research shown below was all undertaken whilst in employment at the Institute of Marine Studies at the University of Plymouth.

Some early works grew from studies undertaken for my part-time Master of Education (M.Ed. HE.) degree at the Faculty of Arts and Education, Exmouth, University of Plymouth, in 1992-1994 (A). Data collection for work 1 in 1993-4 formed part of the M.Ed. thesis, but was substantially refined and revised following critical exposure to peers at national and international conferences (B, C), before publication. Similarly, other data (part of 4, Dinwoodie, 2000b, ch.3) was re-analysed, re-framed and presented at an international conference (D1), published on the world-wide web and in a non-ISSN refereed US journal (D2).

Other work, undertaken as preliminary M.Ed. studies in 1992-3 (E), was modified and re-formulated prior to presentation and publication at an international conference (8).

Works arising from the M.Ed. provided a foundation for, but insubstantial proportion of, the works presented.

Work 5 (1995-6) presented a new context for a methodology developed in M.Ed. studies, and following refereeing for publication, evolved into an instrument focused on maritime business students at Plymouth. This was later administered nationally (1997-8), resulting in work 2 (and Dinwoodie, 2000b, ch.8). Some of the data processing formed part of a research methods course undertaken by year 2 undergraduates.

As part of a reflective process, teaching with Stage 1 students over 1994-6 was critically distilled into paper 9, following initial presentation at a staff development event in Plymouth (F).

Further attempts to define student perceptions of professional employment roles were conducted at Plymouth with assistance in data collection from Peter Holgate (Seale Hayne) and comparative analysis from Dr Harry Heijveld (IMS). An oral conference presentation (G) was later refined (part of 4, Dinwoodie, 2000b, ch.3).

Original work with postgraduate shipping and logistics students was guided by discussions with staff in Plymouth Business School and the Department of Psychology in 1995-6, and reflective reading (e.g. 4, Dinwoodie, 2000b, ch.2). At data collection stages, focus groups in 1996-7 (4, Dinwoodie, 2000b, ch.4), a quantitative instrument (4, Dinwoodie, 2000b, ch.5) and mapping procedure (H; 4, Dinwoodie, 2000b, ch.6) were developed. The instrument was repeated in normal teaching in 1997-9, with student reactions monitored (7), and a national survey resulting (4, Dinwoodie, 2000b, ch.8).

Analysis was discussed at peer conferences relating to mapping comparisons (H; 4, Dinwoodie, 2000b, ch.6), factor analysis of views (4, Dinwoodie, 2000b, ch.5), socio-cognitive explanations (6; 4, Dinwoodie, 2000b, ch.7), and national comparisons (4, Dinwoodie, 2000b, ch.8), in 1997-9.

An overview of a range of issues was widely disseminated to practitioners in Eire (11).

Analysis of data collected during the development of an updating short course for Plymouth Masters alumni as part of a Continuing Vocational Education (CVE) funded initiative, with assistance from Anne McDermott (IMS) in 1998-9, formed the basis of paper 3.

Findings from a survey by Hicham Elmdaghri (1994, MSc student) formed an input to a proposed training regime (4, Dinwoodie, 2000b, ch.9), followed by another based on systems approaches (10).

Signed declarations are included relating to the authorship of works 5 and 6.

Bibliography to declaration

- A. Dinwoodie.J.,(1994) *Transport as a career: a case-study at the University of Plymouth*. Unpublished Master of Education thesis, Faculty of Arts and Education, Exmouth Campus, Plymouth University, 1994.
- B. Dinwoodie, J.. The Decision to Study Transport: A case study at the University of Plymouth. *2nd European Conference of Institutions of Higher Education in Transport*. Oct 1995, Arnhem, Netherlands.
- C. Dinwoodie, J. *The decision to study transport at university*. Presentation to the Organisation for Transport Studies, Derby, July 12-14 1996.
- D1. Dinwoodie, J. What is a logistics analyst ? How students' understanding of some employment roles in intermodal distribution evolves. *Intermodal Distribution Education Academy, Annual Conference, Atlanta, Georgia, April 1997*.
- D2. R. Dinwoodie.,J., 1997. What is a logistics analyst ? : A perspective from one British University on increasing student awareness and knowledge of Logistics Education and Career Opportunities. *US Journal of Transport Management* Vol 9, No. 2 Fall 1997, pp 9

- 15. Published by Delta Nu Alpha Transportation Fraternity & Georgia State University, USA . 4000 words.

E. *Is a group role-based case study rather than an examination question more effective in assessing a course introducing operational research in maritime business?* Exmouth, 1993 (Pg Dip Ed work, 5000 words).

F. A shorter version was presented at the *Integrated learning technologies* conference at Plymouth, Jan. 1997.

G. The Decision to study Transport Planning: A Quantitative Content Analysis of Evolving Undergraduate Perceptions of some Relevant Employment Roles, Institute of Mathematics and Its Applications, *Conference on Mathematics in Transport Planning and Control*, Cardiff, April 1998.

H. Using computers to compare cognitive maps: an analysis of how students decided to undertake postgraduate study *Computers in Psychology*, York University, April 1998 (Dinwoodie, 2000b, ch. 6)

I. Evolving perceptions of the decision to enrol on a postgraduate business course. *UK Council Summer Conference for Graduate Education*, Leeds, July 1999 (Dinwoodie, 2000b, ch.8).

Dr. P.Panayides, Institute of Marine Studies, University of Plymouth.

April 27th 1999.

To whom it may concern:

I at no time made any contribution to the writing of the following paper:

Panayides,P. and Dinwoodie,J. (1999) The decision to study international shipping at postgraduate level: how far does the evidence support recent socio-cognitive theories of career development? *First International Congress on Maritime Technological Innovations and Research. Proceedings April 21-23, Barcelona 1999, pp.755-765.* Department of Nautical Science and Engineering, Universitat Politecnica de Catalunya, Barcelona, Spain.
3000 words. ISBN 84-7653-715-8.

My name appears as a co-author solely because a few weeks prior to the conference presentation, there was uncertainty over whether John Dinwoodie would be able to present his paper in Spain. In the event he was the sole author and presenter.

Signed:



P.Panayides

Dated: 27-4-99

Dr. H.Heijveld, Institute of Marine Studies, University of Plymouth.

To whom it may concern:

My contribution to the paper

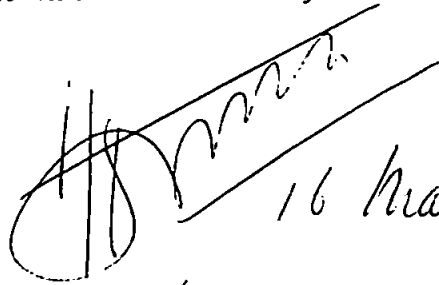
Dinwoodie.J., and Heijveld.H.,(1997) Ensuring quality managers in the marine industry: an analysis of the undergraduate decision to embark on marine studies courses. In Sag, O.K., (ed.), *Proceedings of the Eighth Congress of the International Maritime Association of the Mediterranean. Volume 3, Istanbul, Turkey, November 1997.* Istanbul Technical University Maritime Faculty, Istanbul, Turkey. pp. 13.1.1 - 13.1.10

covered the section in *Background* (page 1) to 7 lines into page 2.

International shipping businesses, supported by related services in finance, insurance, warehousing, ports, shipbuilding and repair, legal services, ship and cargo brokers, and offshore exploration and exploitation of oil, gas and minerals, commercial fishing and marine sport and leisure, all require skilled personnel. In 1994 in the UK the Chamber of Shipping [1] reported a net contribution to the balance of payments of almost £ 1 billion. Marine insurance, banking, P&I clubs, legal services and marine brokers also demand highly trained and specialist expertise.

People in marine related jobs are either employed ashore or at sea, operating ships, fishing, or serving offshore production units. For jobs at sea, professional qualifications traditionally demanded training at nautical colleges, as deck officers or marine engineers before gaining practical experience at sea. IMO is concerned with establishing international mechanisms for controlling education in order to ensure high standards of maritime personnel, for safety reasons, to prevent injury and loss of life [Lopez, 2, 37]. On attaining full qualifications, possibly after a decade of post nautical college experience, many staff in their late twenties sought on-shore employment, where some jobs require sea-going expertise, but others do not. The problem of particular concern in the United Kingdom is that as the number of seafarers has declined, fewer UK nationals are available to fill jobs where professional experience is considered essential, forcing increasing dependence on the continuing availability of other nationals [HMSO 3,4]. The Chamber of Shipping [5] reported 33,000 UK officers employed at sea in the mid-1970's, compared with 7,721 in 1994, of which only 5 % were female. Another trend has been to upgrade the vocational maritime education and integrate it into ever higher levels of education, away from certificates and diplomas to marine based degrees

This section includes a total of 290 words out of a total of 5400 in the paper, the rest of which were written by John Dinwoodie.


16 March 1999
Dr. Harry Heijveld

Critical appraisal

Introduction

Following transfer of the Plymouth B.Sc. Transport programme from a cross-departmental Combined Honours Programme into the Institute of Marine Studies in 1993, the number of subsequent student applications halved. This stimulated investigations of the process whereby students decided to study Transport (Master of Education thesis, 1994) which revealed minimal prior reporting of their perceptions when deciding to undertake vocational studies. Given the necessity of such information in guiding course marketing and design and recruitment into both courses and professions, a further programme of work evolved which explored these issues in related disciplines.

The underlying aims of the programme of research and study were:

1. To investigate the perceptions of students on vocational courses in shipping, transport and logistics regarding why they chose their particular fields of study.
2. To develop instruments with which to analyse how students perceived that they had arrived at their decision to study at Plymouth.
3. To assess a selection of the methods available for analysing student perceptions relating to how they arrived at their decisions to study.
4. To analyse factors that influenced student perceptions and search for any common trends, including perceptions of relevant professional outcome roles.
5. To propose and evaluate alternative approaches to teaching aimed at raising the student's perception of the nature of professional skills requirements.

6. To disseminate research findings in order to promote recruitment into relevant professions and university based vocational courses.

This work is socially relevant in presenting original reports of the perceived attractions of study in these subjects and provides independent evidence to inform recruitment policies. It provides information relating to the perceived importance of enhanced employment prospects by potential applicants when contemplating advanced study and factors which could influence the quality and quantity of entrants to relevant professions (Dearing, 1997a,b). Finally, it discusses novel modelling of individual study decisions as a directed network (Langfield Smith and Wirth, 1992) enabling an original critique of a quantitative analysis of differences between student's cognitive maps as representations of these decisions.

Early investigations centred on the University of Plymouth with its unique portfolio of courses, although comparisons with other centres were reported in later work. Work was conducted in relation to decisions to study by undergraduate students in maritime business, transport and logistics, postgraduate students in shipping and logistics and practitioners seeking updating courses. As work evolved, different issues, instruments and methods of analysing data emerged for each group.

The research reflects a journey of enquiry that was grounded in actual student behaviour. The adoption of a grounded approach ensures a strong behavioural insight but limits the potential for generalisation and policy making. The reality of the studies are that they are based on phenomenology which allows increments of knowledge on the particular, enabling increments in knowledge on a series of frontiers across a class of problems. The tension is between the desire of policy developers seeking to manage education and professional

development for predictive models that enable action, and the availability of models. The reality is the usage of simple models for complex behaviour. These studies have sought to gain insight into the complexity enabling richer insights but not at this stage enabling complex models to be proposed (i.e. generalised from the particular). The studies are at a micro level addressing pedagogy and grounded in individual student behaviour. The approach provides explanation for behaviour in the circumstances. The studies therefore legitimately deny the unification of systematic modelling.

Student perceptions of their chosen area of study

Substantially revised early work (Dinwoodie, 1996) proposed appropriate research methods and revealed a previously unreported staged process whereby undergraduates had decided to study Transport. As an example, relatives and childhood experiences were found to be important influences in forming an initial latent interest and unless children had been exposed to relevant stimuli, their personal and often pragmatic decisions in later life were unlikely to be activated into the behavioural response of matriculating in Transport. Once individuals had made and enacted this decision, they retrospectively justified and took pride in it.

Similar work was undertaken with maritime business students (Dinwoodie, 2000a) attracted to an industry which must recruit high calibre personnel, educated to respond effectively to increasing external pressures. However the onus of acquiring a university education has shifted to the individual, reflecting declining state subsidies available to individual students at British universities and corporate training programmes aimed at meeting the needs of organisations rather than individuals within them. To ensure that the system for producing future supplies of graduates matches ongoing industrial requirements demands an

understanding of why undergraduates enrol on particular courses and how importantly they perceive employment considerations to be when doing so. Original work in this context was reported based on several British universities.

At postgraduate level, quantitative results of applying a bespoke instrument to analyse the study decision in the related areas of international shipping and logistics were presented (Dinwoodie, 2000b, ch.5).

The willingness of industrial practitioners to participate in appropriate updating courses (Dinwoodie, 1999b), crucial to maintaining and enhancing their professional knowledge, competencies and skills, was investigated. If relevant and attractive courses are provided, regular practitioner attendance on them could assist, for example, in reducing the number of marine accidents attributable to professional incompetence. As a precedent to devising and providing updating courses, reviews of the perceived updating needs of practitioners from several industries provided a benchmark. In a survey of Masters alumni in International Shipping and Logistics (ISL) at Plymouth, risk management skills presented a common concern, reported alongside perceptions of the attractions and barriers associated with attending suitable updating courses.

Developing instruments to analyse the decision to study at Plymouth.

Work was conducted to assess whether the initial concerns and decision processes observed in Transport undergraduates at Plymouth could be extended to other marine studies undergraduates. Recognising that individuals currently in university classrooms, as future senior employees, will be responsible for maintaining and raising industrial professionalism, an instrument was devised to link study decisions by marine undergraduates with the future

requirements of the marine industries (Dinwoodie and Heijveld, 1997). However, an absence of literature outlining the career perceptions of marine undergraduates necessitated the adoption of exploratory research methods based on a pilot study employing qualitative techniques, including quantitative content analysis of individual open-ended responses, to ensure high construct validity. Although 'love of the sea' was the major reason for choosing this field, interest in employment issues increased towards graduation. Course quality and its physical environs made Plymouth attractive, and half of the respondents had family or friends in the industry.

Similar concerns were explored based on these open-ended questions, piloted in 1995-6 with Marine Studies undergraduates, which were refined and focused on Maritime Business students, being repeated in 1996-7 in tick-box format (Dinwoodie, 2000a) and extended nationally.

Qualitative empirical work based on focus groups exploring individual decisions to study ISL at postgraduate level at Plymouth (Dinwoodie, 2000b, ch.4) aimed to identify the processes and factors involved in the decisions of mainly international students. In the absence of any known prior work, eight focus groups comprised of students drawn from post-experience and postgraduate Diplomas in International Shipping and Logistics Management and Masters students in ISL were recruited. The process of analysing results and devising a tick-box instrument, which could be administered on future occasions, is reported. Qualitative analysis of focus groups and loosely structured group interviews ensured that the issues that had concerned students when making their decisions were expressed in their own words.

A cognitive mapping approach (Dinwoodie, 2000b, ch.6) was devised for use with postgraduates emanating from a broad range of academic disciplines, industrial experiences and nationalities but nonetheless sharing a common decision to enrol on courses in related disciplines at Plymouth. Methodologies that afforded comparison between the individual decisions of undergraduates displaying greater homogeneity of nationality, age and prior experience were inappropriate at this juncture. The mapping procedure assisted comparisons of perceptions between students, when individual beliefs were mapped and modelled (Langfield Smith and Wirth, 1992) enabling quantitative analysis of differences between cognitive maps. Cognitive mapping is concerned with the ways in which individuals attempt to understand their world, by analysing their accounts of problem contexts, but in this paper, an instrument tailored to computer analysis enabled the factors of concern and items within them to be presented in tick-box format. Causal relationships between concepts were quantified, measuring differences between cognitive maps by a snapshot representation of them as a directed network of an individual's beliefs. The strength of student perceptions were mapped and transcribed into either valency matrices which enabled comparison of the distances between maps, or adjacency matrices which represented the strength of comparisons. Several formulae describing different dimensions of these maps were programmed enabling these key measures to be computed and comparisons to be made between individual maps. Where data was collected for combinations of shipping and logistics students, one synchronal comparison of a single cohort of 54 Masters students generated over 1430 comparisons. When comparing maps, the instance where one issue might influence another but not be impacted on itself defined a 'transmitter' and the reverse, a 'receiver'. Computed comparisons suggested that distance measures constrained by the numbers of transmitters or receivers, and the strength of relationships where appropriate, formed the best discriminators. Student reactions to using

computing technology to submit their questionnaire responses and personal adjacency matrices electronically were reported. Generally, they were supportive.

An assessment of some methods available for analysing student perceptions

Empirical and theoretical explanations of maps and attempts to make comparisons between particular subgroups and explain the factors influencing them were presented. A unified social cognitive theory of career and academic interest, choice and performance (Lent et al 1994) generated new insights into understanding why aspiring managers might seek to undertake study (Panayides and Dinwoodie, 1999; Dinwoodie, 2000b, ch.7). Propositions relating to how the individual manages issues of self-efficacy, expected outcomes from decisions and their personal goals were linked with other personal factors, the contexts within which decisions are taken, and their previous experiences. These propositions generated useful hypotheses, potentially testable against the observed behaviour of enrolled students. However, empirical work with postgraduate students of international shipping at Plymouth revealed problems of conflicting theoretical domains between the bespoke instruments and the socio-cognitive approaches. Some of the verbatim statements used by Plymouth students were only weakly coincident with Lent et al's theoretical concepts, furnishing only tentative empirical support for them, due partly to incongruencies in the methodologies of cognitive mapping and social cognitive theory.

The development of a computer based instrument (CBI) relating to why postgraduate students decided to study ISL, its application in large groups, and an assessment of its pedagogic worth is described (Dinwoodie, 1999c). The challenge of developing an instrument, also involved students in using learning technology (LT). The substantive classroom context investigated Masters students' reminiscences of how they arrived at their

study decisions, and provided a means of ensuring that basic local information technology (IT) facilities that they would use in their subsequent studies had been mastered. It also provided a platform from which, having succeeded in structuring one complex personal problem situation, students could then proceed to tackle less personal problem contexts. Stoner's (1997) model for evaluating the implementation of LT into courses provided a useful checklist and framework within which to address problems encountered while developing the CBI. The view of teaching as a mediated learning process, with an emphasis on a dialogue with students proved useful, as did the model of implementation issues, relating to pedagogy, student and staff motivation and technical considerations. Pedagogically, the instrument improved data collection and handling processes, helped students to personalise a reflective process efficiently in a large group, and integrated their perceptions of the role of IT skills within broader course contexts.

Further avenues for researchers in other countries and disciplines are also presented, (Dinwoodie, 2000b, ch.10). These might usefully concentrate on the very detailed evolutionary processes which shape individual behaviour, institutionally comparative data and comparisons between related academic disciplines, such as international business, or general transport.

Outcome roles and other factors that influenced student perceptions

A critique of some environmental influences on decisions to undertake or provide advanced courses in shipping and logistics is presented. Declining numbers of deck officers and shortages in particular employment groups must surely influence the decisions of applicants to shipping and maritime business courses (Dinwoodie, 2000b, ch.1). Similarly, the environments within which universities undertake to provide advanced courses of study are

pertinent (Dinwoodie, 2000b, ch.2), often in an international setting. Both the pressures placed on universities to recruit international students and influences on the decisions of individuals to undertake study are relevant. Literature relating to preparing future employees for international careers is also discussed.

An account is presented of how student perceptions of employment roles in transport, shipping and logistics may evolve. If such perceptions are not understood, by academics and those advisers responsible for professional recruitment it is impossible to build on and develop students' existing knowledge, to review any characteristic attractions of particular occupations or to define their role in attracting students into vocational courses. Original examples of how such perceptions were observed to evolve and some pertinent qualitative research techniques are presented (Dinwoodie, 2000b, ch.3).

In tracing how the Transport students' perceptions of employment roles related to transport planning developed (Dinwoodie, 2000b, ch.3) town, transport and consultant planners, civil and highway engineers, a transport modeller, and development control and road safety officer roles were assessed. Evolving undergraduate perceptions of these identities with increasing time spent studying Transport confirmed that, as in logistics, new undergraduates displayed a poorly developed schema of concepts. This was verified statistically by using non-parametric measures of the comparability of perceptions between different groups of students. Using quantitative content analysis, the perceived functions of each role and the contexts within which they are practised were defined and statistical measures were computed to compare their subjective analyses by two researchers, with simple binomial procedures preferred. The empirical schema of concepts which emerged, indicated inaccurate perceptions of employment roles in consultancy, modelling, engineering and road

safety and development control officer, prior to the decision to study transport planning having been taken.

Schema development in undergraduate perceptions of pertinent employment roles in logistics is discussed (Dinwoodie, 2000b, ch.3) using data collected, but not fully analysed, during earlier M Ed work. Student perceptions of a range of employment roles relating to international logistics were analysed, in order to trace how such careers awareness evolves, commencing with the role of the logistics analyst, poorly understood by freshmen or new sophomores. The paper discussed the schemae which define the hierarchy of concepts that a student must develop before a particular decision can even be contemplated. Unless the student is aware of the existence and nature of particular employment roles and occupations, then no informed decision to seek to join their ranks can be attempted. Qualitative analysis of student descriptions of relevant roles revealed a schema whereby concepts evolved, enabling a teaching package to be devised which accelerated the learning process. This concentrated on raising awareness of poorly developed concepts such as planning or middleman actions, initially less familiar than executive actions, and technical concepts such as logistics, and relational concepts such as competition.

Teaching aimed at raising perceptions of professional skills requirements

Earlier work (E) was extended (Dinwoodie, 1997a) in a review of the effectiveness of a group role-based case study rather than an examination question in assessing a course introducing operational research in maritime business. Traditional approaches based on lectures and closed-book examination questions were replaced by a group role-based case study, developing a wider range of professional skills. Examination questions may encourage pre-specified, convergent answers, inappropriate to the professional skills

demanded in maritime business. Rather, problem contexts with divergent solutions, demanding attempts to propose and explore possible solutions and emphasising a learning process whereby individuals work with others to manage uncertainty are needed. Group work and case studies are required to develop and assess such skills. The approach had a positive effect on the attitudes of the students involved, both towards operational research and group-work, and the perceived value added by the assessment, and the reliability of the peer assessment were considered. For all those involved, in both teaching and learning, the experience was very positive in enabling a broader range of professional skills in maritime business classrooms to be developed more effectively.

Consideration of how maritime business students optimally develop vital professional skills in managing time, information and technology resources (Dinwoodie, 1997b), revealed how an over-reliance on technology based learning resources may encourage automated learning syndrome. Students may display an impressive ability to generate complex computer output, but a pervading inability to understand why it is needed, or how results have been derived. Complementary approaches to technology based learning designed to resist automated learning syndrome can assist. A taxonomy of educational objectives for higher education, developed initially in the context of engineer education, provided a framework within which to evaluate a variety of learning strategies relevant to technology based learning resources. Although competent to generate computer output, students were less confident when requested to formulate, test and evaluate results from exploratory hypotheses in subject-specific contexts of their own choice, unable to manage effectively their immediate problem environment. The taxonomy was employed to investigate various learning strategies, where following on from introductory computing laboratory sessions, antidotes to automated learning syndrome could be administered. These included literature searches of published works in subject-specialist contexts chosen by students, writing essays about the validity

and testing of assumptions on which techniques were based and group exercises demanding an overview negotiated with peers regarding the role and validity of techniques employed.

Further pedagogic models were developed, aimed at raising professional competence levels in practitioners, in relation to:

1. Managers of ferry services, based on a soft systems approach to defining their specific educational and training requirements (Dinwoodie, 1999d)
2. A systems approach to developing a training regime for inspectors of port state controls in the UK (Dinwoodie, 2000b, ch.9), designed to satisfy the need for industrial practitioners to engage in continuing professional development. As a case study, a survey of the attitudes of practitioners towards port state control in the UK is reported, along with an outline methodology for devising a strategy to better inform and educate participants.

Disseminating findings to promote recruitment into professions and courses

All the papers, but especially those in professional journals (Dinwoodie, 1996; 1999a), were designed to assist in disseminating findings and promoting vocational recruitment. An explicit overview of the attractions to practitioners of a return to study at university (Dinwoodie, 1999a) also disseminated findings to a broad professional audience, including managers concerned with both their personal interests and broader organisational interests. The study process was presented as an investment, offering high returns to both individual participants and their employers.

In an attempt to inform recruitment strategies, comparisons where possible, were made between the national perceptions of undergraduates and postgraduates of their reasons for

undertaking advanced study in maritime business and logistics (Dinwoodie, 2000b, ch. 8). Direct comparison was not possible for some issues, but for sources of information, the roles of self, family and friends and basic employment motives in the study decision, comparisons were made. It was found that the reputations of educational institutions were more important to undergraduates than postgraduates, but basic employment motives were more explicit for the latter. More undergraduates were influenced by talking to people in industry and lecturers, than postgraduates, but literature sources were less important than oral sources to both groups.

Summary

The work submitted provides an original and coherent addition to the state of knowledge regarding the decision to undertake vocational higher education in shipping and logistics at advanced levels in the UK. Documented evidence relating the perceptions of students on vocational courses in shipping, transport and logistics and why they chose their particular fields of study is now available for use by course managers and planners, professional bodies and others with an interest in managing professional and academic recruitment in these areas.

A range of instruments have been developed and used to analyse how students perceived that they had arrived at their study decisions, including national surveys of undergraduates in maritime business and postgraduates in shipping and logistics. Qualitative, quantitative and mapping methods have been devised, and perceptions of relevant professional outcome roles and other factors have been reported.

Exploratory approaches to proposing and evaluating alternative approaches to teaching aimed at raising the student's perception of the nature of professional skills requirements have been presented. However, each individual lecturer will need to develop aids to teaching and learning which will be dependent on their progress in identifying and defining local student schemae.

Similarly, new publications by professional bodies and others, aimed at attracting recruits, provide evidence of progress in disseminating the message to promote recruitment into relevant professions and university based vocational courses. It remains to be seen how critical testing of their impact by other researchers will advance the work presented.

References.

Dearing, R. (1997a), Full and part-time students in higher education: their experiences and expectations. Report 2, *Higher Education in the Learning Society*, National Committee of Education into Higher Education. HMSO, London.

Dearing, R. (1997b), Options for financing higher education: modelling and policy analysis. Report 12, *Higher Education in the Learning Society*, National Committee of Education into Higher Education. HMSO, London.

Langfield-Smith, K., and Wirth, A., (1992). Measuring differences between cognitive maps. *Journal of the Operational Research Society*, 43, 12, 1135-1150. Pergamon Press, London.

Lent, R.W., Brown, S.D. and Hackett, G. (1994), Towards a unifying social cognitive theory of career and academic interest, choice and performance, *Journal of Vocational Behaviour*, 45, 79-122.

Stoner, G. (1997) Implementation issues: leaning towards learning in Fletcher, K., and Nicholson, A.H.S. (eds), *Selected proceedings from the 8th Annual CTI-Accounting, Finance and Management Conference*, Newport, April, pp. 40-51.

Section A.

**Student perceptions of their chosen area of
study.**

Paper 1

THE DECISION TO STUDY TRANSPORT AT UNIVERSITY

Presented to the Second European Forum of Higher Education Institutes of Transport, Arnhem, Holland, October 1995

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Introduction

Many applicants to British universities probably perceive courses in transport as providing an introduction to a relatively low-status profession, at least when compared, for example, with law and accountancy. How might such a situation be reversed? Some answers may lie in research, such as that reported here of a case study which attempted to trace the process whereby young people chose to study transport at the University of Plymouth.

This paper examines the development of student knowledge of courses and potential careers in transport and the sources of information to which they have been exposed. The perceived attractions, shortcomings, and requirements of career openings they have considered, and the influence of family and friends in the decision to study transport are reviewed. Data sources used included published careers literature, triangulated against student questionnaires and interviews, and a survey of careers staff attitudes in feeder and potential feeder institutions.

Both careers staff and students displayed limited awareness of transport careers and, unless students were influenced at an early age by relatives or others already working in transport, school or careers guidance experiences were unlikely to attract them. Responsibility for decisions to study transport, and in particular at the University of Plymouth, were much more personal, with prospectuses or visits activating latent interest, which later developed into a pride in belonging.

Technical concepts such as logistics, or planning, rather than management actions in transport jobs, were not well developed on arrival in Plymouth, necessitating a teaching package designed to raise awareness, which apparently succeeded.

Careers staff were reluctant to conceive of a "transport industry", preferring to think only of occupations which may be pursued in it, but much of their knowledge of transport related only to stereotypes. Measures to raise awareness of careers in the transport industry are needed at all levels, if the profile of the industry is to be raised.

Some Theories of Career Choice and Decision Making

Few theorists consider that work (even in transport) is undertaken primarily for pleasure; Freud (1953) rarely referred to it. Modern psychoanalytic theories of work behaviour (Neff, 1985) indicate that pleasure in work is likely to stem from mastery of one's environment, rather than gratification of primary sexual or aggressive instincts. Adolescents might benefit from being encouraged to explore their environment, find ways in which they can influence it, and then take responsibility for their own decisions and actions. "The child is not much of a vocational animal until he is around 12 years old ... but his school experiences are important determinants of what he will think about when the time comes to do the thinking." (Neff, 1985, p.123).

Kidd and Killeen's (1992) model provided a theoretical framework within which to investigate career choice decisions, based on a "process of negotiation of possible future selves which young people should be encouraged to explore." (p.226)

Careers guidance literature (Holland, 1983) revealed a lack of information to be a major cause of limited occupational awareness (e.g. Boreham, 1993). However, low self-efficacy, where individuals doubt their own ability to perform a task, or belief in an external locus of control, where they do not feel in control of the situation, allowing decisions to be made for them, might be less overt causes. Non-response in surveys might signal a need for guidance experts.

Methodology and Surveys

Literature searches relating to careers in transport (e.g. CIT, 1995a, b; Segal, 1987; Hibbs, 1988) provided one view of sources of information likely to influence young people making career decisions. A questionnaire, designed in part to stimulate interest in the process of how to think about careers awareness by requiring respondents to address new or difficult issues, was administered to undergraduate transport and non-transport students at the University of Plymouth in 1993/4. This was accompanied by personal interviews with new transport students. Surveys of careers' staff perceptions at a variety of feeder institutions, of openings in the transport industry, completed the triangulation process (Dinwoodie, 1994).

A teaching package consisting of lectures, a careers worksheet, and input from specialist student careers advisers, designed to heighten self and occupational awareness, was administered and assessed for a value-added survey. Exploratory research relied more on content analysis of open-ended questions and structured interviews than statistics, with some ethnographical reporting. Tick-box questions were only used to feed-back earlier job descriptions to students in the value-added survey.

The decision to study and hence choose a career in transport, a particular industry, depended in part on how the transport industry was defined, but also on the role of relatives, transport taught previously, and careers education both generally and in transport. These influences in turn affected interest in working in transport, perceptions of transport as a career, and the decision to study transport.

What is the “Transport Industry”?

In an industry employing about two million people, in many occupations in several industrial sectors, we might expect blurred images, which could explain its lack of appeal to outsiders. Respondents were asked to define what they understood by the term, the transport industry. New students highlighted freight rather than passenger movement, were more concerned with notions of profitability, an umbrella term, and business ideas, but recorded more nil returns. By year two, replies were more mode-specific. In a follow-up survey, after some initial transport teaching in year one, more students also identified movement of people, referred to particular modes, or the people who ..., with 90% responding. Perceptions had broadened but focused on social groupings to which students might one day belong, rather than distant stereotypes.

Careers staff were much more comfortable thinking in terms of careers in occupations, rather than transport, a particular industry. Stereotypes, driving and motor vehicle engineering were all more prominent than “transport management” in their definitions. These findings support Hibbs’s view (1988, p.77) that careers staff are unclear about the strength of early commitment to transport, but it seems less certain whether young entrants to the industry are likely to be “well aware of what they want to do [and] know a good deal about it before they leave school.”

Relatives in Transport

Overall, 45% of transport students knew “significant others” in the transport industry, of whom two thirds were relatives, and one third friends. Although only 20% stated an influence on them, others may have been unaware of it, or unwilling to admit it by attempting to display independence from home, as new students. Half of the control group not studying transport knew people in transport, with a higher proportion of relatives than transport students, but only one wished to emulate them.

When asked who had influenced them to study transport at university, a majority of students (55%) reported their own personal interest. Parents and teachers (3% each) and friends and careers teachers (6% each) were also mentioned, and 20% of first year and 30% of second year students viewed such study as a career introduction. The passive roles of stereotypes or unstated approval of significant others remain unknown but are possibly major influences.

None of the careers staff surveyed reported any close contacts with the transport industry, and Gallup (1970) reported greater long-term commitment to shipping from those with relatives in it, because of more realistic expectations. This may help to explain why many careers staff expected little long-term commitment by young people to careers in transport.

Transport Education at School

Aspiring transportants are advised to study "A" level economics or geography (CIT, 1995a). However, only 33% of second year and 17% of new transport students reported any pre-university study of transport, with geography as the major source and economics, environmental sciences and Business and Technology Education Council mentioned. Prior study of transport was rarely a reason for degree study, but may have been significant for some, or, as among the control group, had a negative impact.

More significantly, 66% of second year, but only 40% of new, transport students had relevant work experience, evenly distributed through all modes, implying growing practical awareness and realism as students progressed through the course. In a marine studies control group, marine experience dominated. Follow-up interviews showed fewer students claiming no previous contact with transport, but a face-to-face interviewing medium or growing confidence may have influenced this observation.

Few careers teachers at feeder institutions were aware of transport teaching in their organisations and some were unsure, but it apparently has no single natural subject base. Transport examples feature in national curriculum careers programmes, but are at best discretionary. Taken overall, unless a student has prior interest in transport, school experiences in class or the careers room seem unlikely to stimulate their awareness of the transport industry.

When asked to describe careers education available in transport, replies of most careers teachers were either blank or non-specific; a few mentioned specific talks, visits or library sources. A typical attitude was one where speakers could be invited, but none had been recently. Given that one role of careers teachers is to provide information, this seems inadequate provision for an industry employing around 7% of the workforce. None expressed any desire to advise students to consider careers in the transport industry, unless the individual had already stated this interest.

Sources of Careers Information

Almost all careers staff quoted careers libraries as the main information source, followed by computer databases, with university prospectuses, guidance interviews, and videos also mentioned. Given open access to

facilities, the onus was on students to explore these sources for themselves. New students at Plymouth perceived similar sources including the library, careers office, brochures, writing to firms and reading "the press" (not quoted by careers teachers). By year two the library predominated, the careers office and writing to firms were important, but the press no longer so. New sources emerged in professional journals, lecturers, videos, talks and personal contacts from family or industrial experience. Over time, sources become more personal. The control group were more dependent on firms and the careers service for general vacancies or guidance interviews.

A teaching package, designed to raise awareness of transport jobs and sources of information, involved lectures on structures and employment in the transport industry. This was followed by a group worksheet, preparing detailed descriptions of transport jobs for which students may wish to apply. Careers staff provided debriefing sessions, and the whole package appeared to achieve its objectives:

Interest in Working in Transport

Reminiscence interviews with new students revealed that 46% had developed an interest in working in transport during their childhood, 76% by their teens, with only a few at university admission or entrance. Explicit influences, largely from childhood, came from relatives working in transport; parental interest in trainsets, model cars or car maintenance; consumption of transport in travel, especially air, and academic interest. Passive influences probably involved tacit approval by significant others. These interviews reveal increasing processing of information in higher education, preceded by dependent decision styles earlier in life.

Careers staff were asked to identify which types of student they would advise to consider jobs in transport and why. In response, most saw themselves as facilitators who did not offer advice unless specifically requested; if given, it would only be in a developmental context. They were unwilling to typify because of the range of occupations, levels of jobs and modes in transport, and individual differences in students. Where replies were given, potential transportants were seen as being numerate, interested in business, wanting an active outdoor life, mobile, resilient, good organisers and communicators requiring good academic ability.

Features of Work in Transport Likely to Attract Students

Students and careers staff were asked to identify the features of work in transport likely to attract or repel them. Careers staff noted attractions (in decreasing order) of travel, mechanical work, too general to say, prospects, money, glamour, interest, dynamism, security, outdoor work, flexible hours, and driving, but they preferred to think in terms of occupations, not an industry. Mature students were expected to

display stronger basic employment needs, with interest predominating for younger age groups. In quoting notions of travel, glamour and dynamism rather than money, prospects or interest, careers staff again reveal their perceptions of only short-term commitment to careers in transport.

By contrast, student surveys revealed "love of the job" as the main attraction of working in transport, a fact of which careers teachers are often unaware. Money and diversity were rated lower, but travel was still important to groups of exchange students and mariners.

Some 80% of students stated at least one attraction of work in transport, but 63% of first year and 34% of second year students failed to list any negative aspects, indicating lack of awareness or immaturity. Transport students perceived long hours, boring work and uncertainty in recruitment as negative factors; the control group saw work in transport as boring, with government policy a "turn off". Careers staff highlighted long hours, time away from home, low pay, lack of understanding, negative stereotypes, driving age limits, and noise and dirt. However, encouraging students to consider the downside of transport work, might raise long-term commitment (Kidd and Killeen, 1992).

Most transport students were considering a career in transport. Those who were not included some also studying geography, and about a third of first year students, lacking any clear direction at that stage. Evidence of commitment to the transport industry, rather than specific jobs within it, comes from 74% of year two and 50% of new students stating at least one other perceived career opening for them in transport, after their first choice.

In terms of self-efficacy, all students felt able to meet academic and educational requirements of careers in transport. However, initial perceptions of the demands of work in transport were blurred, with 37% not responding. These might include cognitive or knowledge-based demands as well as issues relating to such elements as emotions and corporate culture. Perceptions of these elements were more focused by year two, with planning, human resource management, quick thinking and communication skills replacing the need for enthusiasm stated by first year students. Good relationships were seen as the main feature, indicating a need for careers staff to be more aware of the role of groupwork and human resource management skills in preparation for transport careers.

Modal Career Interests

Some 43% of new transport students, but only 5% of second year students, were unaware of the educational requirements of jobs which they might do in transport. This could reflect inadequate knowledge of jobs available or uncertainty over personal job choice for one third of

new students. All modes were represented, with first year students most interested in rail, shipping and road haulage, second year students in air and shipping, and the control group, mainly mariners, in shipbroking and shipping operations. Such breadth of interests seem to support a flexible, amodal course philosophy.

Career choice changes observed among first year students seem commensurate with Kidd and Killeen's (1992) process approach. Between entering university and mid year one, in a group of 31 students, eight made major changes to their preferred careers in transport, six previously undecided now wanted to work in transport, and two remained uncommitted. Of two others, initially attracted by the glamour of pilot training but realising the overwhelming competition, one now preferred airline management following parental advice, and another car marketing. A potential ship manager, disillusioned with UK shipping policy, now preferred to become an environmental transport officer, arguably still a fantasy at that stage. Other role changes were from logistics manager to logistics analyst and a shift to a shipping agent, resulting from reading and reflecting on the lifestyles involved in each role. Only half (16/31) remained committed to their original plans and 4/31 remained undecided. Although students' behaviour may not mirror their stated intentions, and they were permitted only one choice here, it seems that careers education was needed for at least half of these new undergraduates, even on a vocationally based course. When students became aware of and reflected on such roles as that of logistics analyst, more realistic concepts of possible future selves seemed to develop.

The Decision to Study Transport

Of decisions to study transport at university, 75% were taken at admissions or clearing and 23% at enrolment influenced by self (54%) rather than parental influence (23%) or friends. Career considerations predominated (46%) but academic interest and a university prospectus were significant. The decision to study transport at university was pragmatic and later in life, with most students claiming personal responsibility for taking it.

These elements became stronger in the decision to study transport at Plymouth, with decisions taken at or after university admission, and only 12% involving parents or relatives. Friends and other advisers were significant for some but decisions were pragmatic, influenced by proximity to home, realistic offers and open days. Reasons for studying transport at Plymouth included its "marine image" but the town was increasingly seen as a "nice place" as the course progressed. Many did not consider study elsewhere, and reputation and course content were attractions. Later, interviews highlighted pragmatism turning to self-justification for having chosen Plymouth. Good teaching, reputation,

a nice place and location teamed with "social life" revealed a pride in belonging and adjustment to life in a new environment. Few new students and even almost half of second year students stated nothing which might put them off studying at Plymouth. Factors such as remoteness from home and climate are beyond our control, but could reflect lack of belonging. Statistics and computers, poor facilities, and lectures clashing with sports worried a few students, with some new students doubting their ability to cope. Interviews revealed other negative features such as costs of study, housing and climate. These comments may provide evidence of students having grasped the need to consider the drawbacks in a process approach to career development, or may reflect realities of student life which may have been surfacing.

Conclusion

The decision to study transport at Plymouth seems to involve:

- an initial interest in transport, possibly from relatives, which may be reinforced at school, but which remains latent;
- a decision to study transport, possibly involving relatives, where university admission activates latent interest;
- a highly personal, pragmatic decision to study at Plymouth;
- justification of, and pride in, this decision coupled with increasing awareness of the realities of life in Plymouth.

The prospectus and visits on open days were important elements in the decision to study at a particular location, for many students. At this point, issues such as course structure and flexibility, reputation, local heritage, modes in evidence locally, and course resources are significant.

Recent developments in the availability of careers information in transport (CIT, 1995b) are an essential part of raising the profile of the industry and attempting to attract talented young people into it. However, much remains to be done in terms of closer involvement of careers officers with the transport industry, and their understanding of an industrial commitment to it. Until the profile of the transport industry and the status of professionals within it can be raised, the "chicken and egg" situation where a career in transport is sold at best as a "cinderella" experience will pervade.

References

- Boreham, NC and Arthur AA, 1993, *Information Requirements in Occupational Decision Making*, Employment Department Group, School of Education, University of Manchester, Research Series No 8
- CIT, 1995a, *Careers and Employment in Transport*, Chartered Institute of Transport, London

- CIT, 1995b, *Careers on the Move*, Chartered Institute of Transport, London
- Dinwoodie J, 1994, *Careers in Transport: A case-study at the University of Plymouth*, unpublished Master of Education (Higher Education) thesis, Faculty of Arts and Education, Exmouth Campus, University of Plymouth
- Freud, S, 1953, *Civilisation and Its Discontents*, Standard Edition of the Complete Psychological Works, first published in German 1939, Hogarth Press, London
- Gallup, 1970, *The attitude of seafarers to their employment*, "The Committee of Inquiry into Shipping", Social Surveys (Gallup Poll) Ltd
- Hibbs, J, 1980, *An Introduction to Transport Studies*, (2nd edn) Kogan Page, London
- Holland, JL, 1983, *Making Vocational Choices: A Theory of Careers*, Prentice-Hall, Englewood Cliffs, New Jersey
- Kidd, JM and Killeen, J, 1992, "Are the effects of careers guidance worth having? Changes in practice and outcomes", *Journal of Occupational and Organisational Psychology*, Vol. 65, pp219-234
- National Curriculum Council, 1990, *Careers Education and Guidance*, Curriculum Guidance Series, No 6
- Neff, WS, 1995, *Work and human behaviour*, third edition, Aldine, New York
- Segal, A, 1987, *Careers Encyclopaedia*, 12th edition, Cassell Educational Ltd

Paper 2



The perceived importance of employment considerations in the decisions of students to enrol on undergraduate courses in Maritime Business in Britain

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In recent years, external pressures on maritime businesses have increased their need to employ high calibre personnel, educated to respond effectively to these pressures. Set against this requirement, the onus of acquiring a university education has shifted to the individual, as state subsidies to individuals seeking to undertake higher education in British universities have declined, and many corporate training programmes have been aimed at meeting the needs of an organization rather than the individuals within them. If the future supply of graduates is to match ongoing industrial requirements, one needs to understand why students enrol on particular courses, and how importantly they perceive employment considerations to be when making their decisions. This paper reports on a survey of why students at several British universities chose to enrol on undergraduate courses in Maritime Business, and considers the implications of its findings for ensuring that an adequate supply of suitably educated graduates will continue to be available to meet industrial needs.

1. Introduction

Employees of the highest calibre are needed if they are to be able to respond effectively to recent changes in the business processes of the maritime and transport industries. External pressures imposed on maritime businesses by globalization [1], regional harmonization [2], competition [3], technological innovation [4] and other trends pose severe challenges for even the most knowledgeable and competent employees. Within this turbulent environment, the need for maritime businesses to ensure an adequately qualified human resources base is well documented. At one level, Thomas [5] noted that problems of low productivity in Indian ports were attributable in part to the lack of an effective manpower development programme, with a need for a clear statement of the required qualifications of new entrants to various departments. At another, the failure to promote an enterprise culture in many Italian shipping companies has been attributed in part to a need for more specialized university courses in management [6].

Set against these requirements, the onus of responsibility for attaining qualifications has shifted increasingly towards the individual, both in relation to training provision and university education. Within organizations, informal or inconsistent provision and evaluation of employee training programmes may subject them to ephemeral funding constraints. Such programmes as are provided are more likely to be evaluated in terms of either their scientific impact relating to their overall costs and benefits to the organization, or humanistic effects relating to changes in how

participants think, react or interact with each other [7], and may not satisfy the professional and vocational training needs of individuals. One example is where corporate training programmes may be restricted to the minimum required to ensure that on-board staff can handle equipment effectively [6], leaving individuals to satisfy any other educational requirements personally.

Pressures on students to make provisions for their own educational needs have also increased in British universities. The issue of student loans as a vehicle for funding higher education is well established where various models for extending them have been proposed (e.g. [8]). Although the economics of the issue are complex, involving distributional considerations in which individuals, employers, governments and institutions might all benefit from, and hence be expected to fund, the educational process, the onus is now on individuals to make considered choices before undertaking study. In an international environment, university courses in Maritime Business in Britain, with its shipping tradition and international business functions in London, should attract overseas students. However, the predictable response by British universities to increased funding pressures in the 1980's [9] of directing marketing and recruiting initiatives aimed at overseas students, may have left some students prone to language problems, socially isolated and remote from home in institutions where specialist provision of accommodation, counselling and support services was limited.

In the face of rising pressures on maritime businesses to recruit more graduates, but a reduced willingness of governments and businesses to fund individuals seeking to enter higher education (HE), it is important to understand the perceptions of students when deciding to study in HE. Some individuals in industries characterized by rapidly changing technology and information systems may be compelled to fund lifelong learning [10] to remain in employment, and others may have more choice available. This study aims to explore the perceptions of undergraduates enrolled on Maritime Business courses in Britain, in particular their reminiscences of the process whereby they decided to undertake study in HE and its links with their broader career interests. After briefly considering literature relating to the demand for maritime business graduates, and the role of employment and other considerations in the decision to undertake undergraduate study, section 3 outlines the methodology used in a survey of career perceptions of undergraduates in Maritime Business in Britain. Their responses, related to issues addressed in the survey, are presented before noting the implications for ensuring an adequate supply of suitably qualified graduates.

2. Literature review

2.1. *Employment in Maritime Business*

Maritime business graduates may seek work in shipping finance, insurance, warehousing, ports, shipbuilding and repair, legal services, ship and cargo broking, off-shore work, commercial fishing and marine leisure. In 1994 this activity generated almost £1 billion in net contributions to the balance of payments [11], complementing those employed in operating ships, fishing, or serving offshore production units.

In terms of the number of seafarers in the UK, decline has been dramatic, with fewer UK nationals now available to provide important expertise in support roles, raising the requirement to employ non-UK nationals [12]. Only one-quarter of the number of UK deck officers employed at sea in the mid-1970's were so employed in the mid 1990's [13], with further implications for the career prospects perceived by new entrants and the problems of recruitment. In mid-1997, assuming an officer

retirement age of 65, 9156 deck officers were expected, reducing to 7690, assuming a retirement age of 57, of whom some 9% are usually shore based at any one time. Given an ageing workforce, where 71% of officers are aged over 40 years, compared with 43% for the UK in the 1991 census [14], by 2002, the most likely employment of UK officers is projected to decline by a further 19%. Only a doubling of the intake of cadets could reverse the decline, but the workforce in the long term would still lack the experience of the existing 66% of deck officers who possess Class 1 certificates.

A recent survey [15] estimated some 17000 UK jobs in which employers would prefer to employ ex-mariners, with seafaring experience considered to be essential in 70% of these, including ports, classification societies, consultants, marine equipment, federated shipping companies, ship management, surveyors, inspections and related activities. By 2004/5, a forecast shortfall of 275 employees per annum is likely in an annual demand of about 700 [15], but 'the university of the sea' provides a training unmatched by third-party sources, foreign ex-seafarers or the quality loss which would result from employment of non-seafarers. If supply shortages lead to increases in salaries ashore, this may tempt even more seafarers away from active service, and many traditionally London based maritime businesses may be enticed overseas. Coupled with this, the traditional vocational maritime education has been supplemented by increasing numbers of graduates and postgraduates, changing the nature of skills which are available for maritime businesses to draw on. Although the skill base of employees lacking in sea-going experience will never fully replicate that of ex-seafarers, even with more specialist training at higher cost, organizations which are sufficiently large and diverse to provide some in-house sea-going experience, may be enabled to utilise graduates effectively. Third party provision of education and training for non-seafarers, possibly by educational institutions, is essential where many potential employers are too small to provide or fund training in-house. Even then, poaching of qualified personnel is likely by firms who recruit only intermittently, except where an established identity such as in the ports sector, already acknowledges the wider importance of this training.

2.2. The role of employment considerations in the decision to study

Against this backcloth of changing opportunity structures in maritime business, how significant are employment considerations in the thoughts of potential undergraduates when applying for places in (HE)? In a recent report, Dearing [16] noted that 48% of students had entered HE to improve their labour market prospects, but personal, intellectual and social development were also cited. This might explain why one quarter of the marine studies undergraduates surveyed at one university [17] failed to respond to questions regarding their preferred careers. Logically, basic material employment concerns which represent a course-outcome might be expected to focus towards graduation, as they displace initial concerns regarding the content of courses. Some evidence supports this [17], where advanced students were observed to prefer more specific categories of marine employment, and the main attractions of study varied from applicants with a 'love of the sea', to advanced students concerned with pay, status, responsibility and good prospects. If verified elsewhere, these findings might imply a dual funding mechanism for such courses, including perceptions of both a consumption good studied largely out of interest and yielding personal utility in the initial stages, and an investment good yielding wider social benefits, on graduation. However, current industrial remuneration packages already reflect both non-monetary advantages associated with careers including travel and a dynamic

workplace [18, 19] and disadvantages associated with separation from home and a stressful working environment.

The issue of who funds studies, may have some impact on whether and when individuals choose to satiate their personal educational needs by deciding to enter vocational HE. Despite research into what motivates such study, either generally [20] or in transport [18] or marine studies [17], the precise perceived benefits remain uncertain, hinting that a single funding mechanism which meets all individual, corporate and national criteria may prove illusive. As Dearing [16] noted:

For students... the benefits of HE are partly those of an investment: they spend time, effort and money gaining higher qualifications which lead to greater satisfaction, often including a higher earnings profile... [This is] complex to understand, involving considerations of uncertainty and limited information about future earnings. Students may also see HE as a consumption good, generating benefits while they are studying, e.g. enjoyment of learning, additional sporting and social activities... demand is likely to vary inversely with price.

There is some evidence that students, especially those approaching graduation, understand [17] that employers may consider 'experience' to outweigh the academic skills of potential new entrants to the shipping industry [6]. When considering which non-academic qualities employers may be seeking, interpersonal-skills of 'dealing with people' and 'communication' have been quoted, in addition to personal qualities of patience, initiative, enthusiasm and responsibility. Hard-work, reliability and confidence should be developed in HE, along with transferable skills such as numeracy and problem solving, language and presentation skills. 'Experience' is less easy to acquire in the classroom. In this paper, concerned with the reasons for undertaking study of Maritime Business in HE, these affective elements of employment are assumed to be subsumed by positive responses to the prompt 'I needed to improve my job prospects'. Whether it could be shown that HE really does develop such skills, and in investing in human capital should charge students higher fees, remains a moot point until their broader reasons for study are established.

Traditional career choice models often infer links between the primary career interests of an individual and their chosen career options [21], implying some matching of career interest to requirements by matriculation. However, whilst acceptance on an undergraduate course might imply that an individual has decided on their preferred occupation, with an intent to enter their chosen profession, it makes no guarantee of them actually entering it, and it may not become their attained profession on graduation. 'People not only select occupations, they are selected for occupations' [22]. Apart from the usual selection processes by employers, Tsakos [23] has questioned whether entrants to degree courses in marine studies will meet their expectations after completing their studies. The risk is shared, where student perceptions of the demands of a career in industry may be unrealistic, and professions may encounter difficulties in attracting sufficient able recruits.

2.3. *Possible attractions of studying Maritime Business*

Many of the reasons for studying Maritime Business at university may be linked with the attractions of a career in this field [24], if study in HE is indicative of employment aspirations, but literature relating to both elements is needed to define the issues involved. Information available to prospective seafarers provides one view of the issues involved in choosing a maritime related career [19, 25] even if somewhat dated and not aimed at university applicants, and surveys of how participants perceived

their careers at sea [26, 27] form a second source. Also relevant is work relating to particular occupational preferences [28] and how decisions to study related subjects at university are made [18].

Traditional stereotyped images of seafarers, denoting travel as the main reason for wanting to go to sea [27] may still persist today, and there are many accounts describing such work, e.g. [25], which may still be read by potential recruits. However, as the industry declined, so did much of the prestige and glamour associated with it. Reports of ever declining time spent ashore in foreign ports [27], and pay levels which in reality were similar to those in other occupations did little to attract recruitment. Other reports [19] noting the increasing routine associated with the work of ship's officers did little to fuel interest in recruits.

Recent surveys of differences in the ways in which teenagers in coastal and inland areas made their career choices [28], with particular regard to the perceived status of merchant navy officers, have upheld the influences of many of the traditional stereotypes. Needs for travel, responsibility and adventure were perceived as being satisfied by this profession, but the adequacy of monetary rewards was perceived as being higher among coastal respondents. In terms of the effects on perceptions of knowing a seaman, those who did so were found to be more likely to want to go to sea, and to rate the status of seamen more highly than others. Career enjoyment, salary, security and prospects, social contact, responsibility and adventure were found to influence career choice, and salary, responsibility, stability, and prospects were reported as attractions of careers in the merchant navy. Spending too much time at sea, danger, poor living conditions and seasickness were noted as the least attractive aspects of such work, with negative images gleaned from the media, often reporting strong images such as disasters, an influence.

Some insights into maritime career choice patterns yielded by an investigation [26] into why seamen chose to end their careers in the merchant navy, often prematurely, are probably still relevant business careers demanding extensive international travel. One finding, that the majority had not planned to go to sea for life, except among deck officer ranks, implies a lack of long term career commitment in many recruits. Domestic problems, arising from prolonged separation between home and workplace, caused more seamen to leave for marriage and family reasons than any inadequacies in their remuneration or poor working conditions, although many deck officers were unwilling to encourage others to follow in their footsteps because of job insecurity. Against this background, a high proportion of married seafarers reported a tradition both in their own and their spouses' family of going to sea. Work by Fricke [27] helped to explain this process, whereby it was only amongst potential recruits who had had direct contact with 'significant others', including relatives or peers, who had engaged in seagoing careers, that any realistic exchange of information had taken place, with others dependent entirely on the images acquired through stereotypes to which they had been exposed. Sources which extolled the virtues of travel, adventure, status and early responsibility were unlikely to report on the realities of shipboard life. Eventually, the gulf between the unrealistic expectations of status or working conditions, and the reality of a mundane working life would manifest itself in dissatisfaction, to the point that careers at sea would be ended prematurely. Only those employed in higher status posts, who themselves had had relatives at sea, were prepared for the true nature of their work.

3. Methodology

Early work highlighting the attractions of sea-going careers [26, 28] helped to define many issues which young people were likely to consider when making this early career choice decision, well-understood by personnel managers [29]. However, in spite of recent attempts to develop a unified socio-cognitive theory which links academic and career choice decisions [24], it is conceivable that the set of perceived attributes of even a vocational course of university study differ from those of a career, where the former does not imply the same level of long-term vocational commitment as the latter. Previous studies [17, 18] encountered such a dearth of published literature relating to why undergraduates chose to undertake academic study in transport and marine studies, areas akin to Maritime Business, that it was necessary to resort to exploratory qualitative research methods in order to establish the parameters relevant to many study decisions. Following this work, quantitative content analysis [30] of open-ended responses to a structured questionnaire enabled an instrument appropriate to Maritime Business to be developed and presented to them in simple tick-box format.

Completed replies were received from 418 undergraduates studying at least some Maritime Business on courses at British Universities in the academic year 1996–1997, including Cardiff (15 replies), Liverpool John Moores (78), London Guildhall (14), Plymouth (240), Southampton Institute of Higher Education at Warsash (67) and elsewhere (4). Responses were analysed by course stage (Stages 1 and 2), age, gender and nationality. Loose classification by nationality defined students from Britain, Northern and Southern Europe, and Asia.

Students were requested to think of themselves in relation to the decision to embark on undergraduate study in Maritime Business at a UK university, thinking of the factors which were important to them in this context. Major issues related to the attractions of particular careers on graduation, how they would find out about careers and courses in maritime business, the reasons which made studying Maritime Business at university, in general and then at their present university, attractive, and reasons which might have put them off studying at their present university, or attracted them to a different university, were also requested. Several items within each issue were also highlighted for the substantive questions, with students being requested to rate the importance of each item in their overall perceptions of their decision to study, including the ratings of very and quite important, indifference, or not featuring at all in their decision. Other details relating to the precise university, course and stage of study, gender, age, nationality and the nature and length of any work experience were also recorded.

4. Results

The sample obtained included females (18% in Stage 1; 31% in Stage 2), mature students (8% of Stage 1 and 11% of Stage 2 aged over 30 years), and many nationalities; including Britons (54%), South Europeans (33%), North Europeans (7%) and Asians (5%). At those universities which recorded a 100% sampling rate, the inclusion of some less-motivated students reduced mean variable ratings compared with those where only interested students responded. This effect frustrated statistical inference, where estimates of, for example, the non-parametric Kruskal-Wallis h statistic, testing for a one way variation between k sample medians, indicated the university to be a statistically significant source of variation at the 95% level, on all but seven variables. Where median variable ratings were apparently more equal

between universities, relating to the importance of written sources of information, parental pressure, distance from home, local climate, a more exciting city elsewhere, proximity to home and age, it was probably safer to infer that perceptions of these issues did in fact vary between universities. Non-systematic variation in the impacts of this effect denied the weighting and normalization of data, making it more appropriate to present many raw statistics as simple frequency tables.

More reliably, non-parametric Mann-Whitney U tests were used to infer differences in the measures of central tendency arising from gender and course-stage effects. In tests conducted over all variables, gender presented a significant source of statistical variation on only six variables, and course-stage on five. Regarding gender, it was 99.9% certain that females rated the maritime lawyer role more highly than males, with 95% certainty of variation in the importance of previous work experience, interest in the sea, parental and peer pressure and the local climate. Course-stage effects showed 99.9% certainty in variation by age (as might be expected), length of work experience, and reading job advertisements, and 95% certainty in variation in the importance of reading magazines, and writing to companies. Non-parametric inference of correlations, using Spearman's rho statistic, also enabled comparisons between distributions of variable ratings, but detailed analysis relates to issues which confronted undergraduates in making their study decisions.

4.1. *Careers in Maritime Business which attracted students*

Based on content analyses of earlier open ended replies among marine studies undergraduates [17], the attractiveness of careers preferred by business students were estimated (table 1). Although perceptions of these roles may change as studies progress, and commitment to particular careers may increase after students have experimented with projections of themselves in relation to new career options, most undergraduates should be forming realistic views of their possible future roles. In that it can provide an identity and filter through which experiences in unfamiliar roles can be interpreted, high career-decidedness may raise the psychological well-being [31] of an individual, helping them to accept that difficult work situations may need to be overcome along the path to achieving long term goals.

As might be expected among students who had chosen university in preference to going to sea, only 14% were attracted by the role of deck officer. This proportion

Table 1. The attractiveness of various careers to Maritime Business students. The careers considered by undergraduates in Maritime Business. Percentage of each group who were at least 'quite attracted' to the stated career.

Career	Stage 1	Stage 2	Males	Females	Age < 20	Age 20-30
Deck officer	14	14	14	14	17	14
Ship broker	57	56	58	54	55	60
Port manager	33	42	38	35	30	38
Transport manager	40	35	38	37	41	34
Import/export	33	38	35	41	36	37
Marine insurance	42	48	45	46	41	52
Ship manager	52	48	53	45	54	50
Maritime lawyer	32	39	32	49	35	39
Freight forwarder	37	39	39	34	38	39
Marine leisure	26	29	26	28	28	26

Table 2. The impact of nationality on the attractiveness of careers in Maritime Business. Percentage of the group shown who were at least 'quite attracted' to the stated career.

Career	British	North Europe	South Europe	Asia
Deck officer	17	11	12	4
Ship broker	39	74	77	81
Port manager	37	56	30	52
Transport manager	33	48	42	33
Import/export	32	48	37	52
Marine insurance	35	52	60	43
Ship manager	35	63	69	86
Maritime lawyer	28	26	50	33
Freight forwarder	29	41	49	43
Marine leisure	31	11	22	24

varied little by age, gender or career stage, but was marginally more attractive to those of British origin, and least so to Asians. Such limited interest signifies a need to ensure that Maritime Business graduates are exposed to experiences which will maximize their knowledge and understanding of sea-going conditions while in the classroom, to enable them to contribute effectively in business situations which require this understanding. The role of ship broker was perceived as the most popular career, being considered as at least quite attractive to a majority of all students, slightly ahead of the ship manager's role. In both cases, males and older students were slightly more attracted than other groups, which may reflect either some lack of self-efficacy among female students, or an increasing concern for basic material needs associated with both roles, among older students. Careers in port management, marine insurance and maritime law all became relatively more attractive towards graduation, perhaps reflecting a lack of awareness of such openings among freshmen students, but there were gender variations between these groups. Female students were more attracted to maritime law, while males were slightly more attracted to the other two roles, possibly reflecting the self-efficacy issues noted above. The only role which became less attractive by Stage 2 of the course, was that of the transport manager. This may reflect a slight change in the sampling regimes employed, whereby specialist logistics or transport students may have been included in some of the generalist freshmen groups sampled, but excluded from specialist maritime business groups in Stage 2. In any event, the need to expose more female students to positive images of their possible roles in shipping management is apparent, along with a need to raise the attractiveness of seagoing careers to graduates of maritime business, if better provision of roles is to ensue.

Preferences for marine insurance careers were significantly correlated with those for maritime law and ship broking, with oral contact with practitioners the preferred means of gleaning information. Transport manager, importer/exporter and freight forwarder were also correlated, with preferences for attending careers presentations and writing to companies. Preference for deck officer roles were not related closely to other preferences.

Some regional variation by nationality in the patterns of career interest is apparent in table 2. For most roles, British students were apparently attracted to a narrower range of employment roles, representing either a more focused and developed view of their future career interests, or a reduced willingness to express strong views over a wider range of issues than for some other nationalities. All groups were

Table 3. Sources of information relating to courses and careers in Maritime Business. How would you find out about courses and careers in Maritime Business? Percentage of the group shown to whom the source was at least 'quite important'.

I would:	Stage 1	Stage 2	Male	Female	Age < 20	Age 20-30
Talk to people in industry	61	68	65	63	62	67
Talk to my careers adviser	54	60	54	63	57	59
Talk to my lecturers	58	61	60	59	56	62
Read job advertisements	45	63	53	58	46	57
Read magazines/books/ brochures	61	70	66	67	64	65
Write to companies direct	51	63	57	55	54	59
Talk to friends/relatives	38	46	44	39	40	47
Attend careers presentations	47	53	50	54	47	53

attracted to ship broker and ship manager roles, but with particularly high proportions in the Asian students surveyed. The port manager's role was particularly attractive to North Europeans and Asians, and maritime law attracted more Southern Europeans, perhaps reflecting particularly rapid growth in that region. Unsurprisingly, careers in marine leisure were less popular, perhaps due to climatic considerations, in Northern Europe, but relatively more popular among British students. Taken overall, regional variations may help to explain the perceived attractions of study at British rather than other universities, but the precise proportions are probably of less interest than the broad trends displayed.

4.1.1. Sources of careers information. Reading books, magazines and brochures and talking to people in industry (table 3) are the major sources of finding out about careers and courses in maritime business, and varied little by course-stage or sex. Talking to lecturers and careers advisers were also important sources of information, with the later slightly more important to females. Reading job advertisements and writing to companies direct were both important sources, but again of more immediate moment to Stage 2 students. Talking to friends and relatives and attending career presentations were less important than other sources, but there were significant correlations between those who talked to lecturers, people in industry and friends, and attending careers presentations, and the perception of good facilities at a university, a good social life and coastal location.

4.2. The attractions of studying maritime business at university

Interest in their subject, expressed as 'love of the sea' was of importance to two-thirds of students (table 4), and was particularly strong in older males, with concern to improve their job prospects being important to around half of the students, especially in Stage 2, supporting earlier work [17] which suggests that material concerns rise towards graduation. Equally important, and not varying by group, course reputation was a major attraction, although prior work experience was an influence, especially among older males, and the advice of former lecturers had been important to some. The explicit influence of family, friends and peers may have been significant to a few, but tacit approval may also have been significant to an unknown percentage of others, or some may have been unwilling to acknowledge insecurity after leaving home [32].

Table 4. Reasons for studying Maritime Business at university. What reasons made studying Maritime Business at university attractive? Percentage of the group shown to whom the named attraction was at least 'quite important'.

I was attracted because:	Stage 1	Stage 2	Male	Female	Age < 20	Age 20--30
of my previous work experience	28	26	31	18	17	28
of my interest in the sea	62	67	67	58	62	69
of the course reputation	47	47	47	47	47	49
of advice from my previous school/course	20	23	21	22	22	22
I needed to improve my job prospects/begin a career	49	55	53	54	45	55
of parental pressure	12	10	11	11	12	11
my friends were doing the same	6	4	5	2	4	6

Table 5. Reasons which attracted Maritime Business students to select their particular university. What reasons attracted you to choose your present university as a centre at which to study Maritime Business? Percentage of the group shown to whom the named reason was at least 'quite important'.

My university:	Stage 1	Stage 2	Male	Female	Age < 20	Age 20--30
is in a city with a good social life	36	39	38	34	40	39
is located near the sea	46	50	49	45	48	50
is located in a nice place	48	44	40	43	55	43
has a world-wide reputation	61	52	60	54	62	57
offers a course which is unique	65	66	66	65	64	69
is near home	15	13	15	14	13	9
seemed to offer good facilities	46	49	48	49	49	51

4.3. *The attractions and turn-offs of studying Maritime Business at a particular university*

There was relatively little variation in the proportions who stated why their particular university had attracted them to study there (table 5). Course considerations predominated, with uniqueness universally important, and a world-wide reputation particularly important to freshmen. The lure of good facilities and a location near the sea were equally important, but location in a nice place was again perceived as particularly important by freshmen. Location in a city with a good social life was important to one-third of students, and being near home may have been particularly important to the relatively small percentage who highlighted this issue.

The major reasons which might have put students off studying Maritime Business at their chosen university (table 6) again show the importance of course content, particularly for females. If resources had been perceived to be poor, more mature students would have been put off, as would the perception of a 'bad atmosphere', but there were significant correlations between perceptions of course content, resources and the general atmosphere. Feelings of self-efficacy were important to around 30% of this sample, with little variation by groups, but the lure of good employment could have prompted a significant proportion to rethink their plans. Poor climate, or feelings of remoteness from home were issues for some students, but more overt than the 30% who stated that nothing could have deterred them, in need of ongoing careers education to encourage realistic thoughts about their possible future selves.

Table 6. Reasons which might have put Maritime Business students off studying at their particular university. What reasons might have put you off studying Maritime Business at your present university? Percentage of the group shown to whom the factor was at least 'quite important'.

	Stage 1	Stage 2	Male	Female	Age < 20	Age 20-30
Nothing could have put me off	34	30	32	32	31	30
If I had been offered a job before arriving at university	23	26	26	18	21	27
If I had felt it was too distant from home	13	15	15	12	19	11
If I had obtained poor grades, or felt unable to cope	30	28	29	32	31	31
If the course content or structure had been poor	53	57	54	63	57	58
If I had felt the local weather was not good	10	9	10	7	12	10
If I had considered it to have poor resources	44	48	47	43	31	52
If I had not liked the atmosphere there	35	30	33	31	37	33

Table 7. Reasons which might have attracted Maritime Business students to study other than at their present university. Why did you consider studying Maritime Business other than at your present university? Percentage of the group shown to whom the reason stated was at least 'quite important'.

	Stage 1	Stage 2	Male	Female	Age < 20	Age 20-30
They offered me a place	33	37	35	41	36	38
I did not consider studying elsewhere	23	19	21	24	20	21
They offered a better course	36	31	34	33	36	34
They offered a similar course	30	33	34	31	39	33
The other university was in a more exciting city	17	12	16	12	14	16
The other university was nearer home	10	9	9	11	12	8

4.4. *The attractions of studying maritime business at a university other than their present one*

The offer of a place, or the lure of a better, or at least similar, course were the major reasons for tempting students to a university other than their current one (table 7), with each factor being important to around a third of students, with little variation by group. In that only students who had considered the down-side are likely to be committed fully to their decision [33], the 20% of students who had not considered courses elsewhere were of concern, representing a low level of maturity. The desire for a more exciting city, or a university nearer home were again important issues for a minority of students.

5. Conclusion

Businesses which support the UK shipping industry make a significant contribution to the UK economy, but mirroring the decline in the numbers of active UK seafarers

in recent years, those which traditionally employed ex-scafarers are likely to face a shortage of ex-deck officers. Areas affected include ports, classification societies, consultants, marine equipment, federated shipping companies, ship management, surveyors, inspections and other activities. University graduates in Maritime Business may provide one alternative source of supply, and in order to assess their aspirations, this paper investigated the perceived importance of employment considerations in the decisions of students who had enrolled on undergraduate courses in Maritime Business in Britain.

In a sample of over 400 Maritime Business students at six UK universities, only 14% were attracted by the prospect of careers as deck officers, the least popular of the options presented to them. This indicates a need to maximize their exposure to situations in the classroom which develop the understanding traditionally gained from sea-going experience in the 'university of the sea' if they are to gain competence in practical skills to contribute effectively in business. Measures might include ensuring that course content is relevant, and there may be a case for work-placements in university courses. At the other extreme, shipbroking was the most popular career choice, and interest in all managerial roles rose towards graduation. Although relatively more females were attracted to maritime law, their self-efficacy in managerial roles needs to be raised by exposing them to positive images of females in these contexts, in order to avoid gender imbalances in future years.

The major sources of careers information to which undergraduates had been exposed included literature such as books and magazines, but also oral contacts with professionals in industry. One challenge to industrialists is to find ways in which more young people can be exposed to a broader set of sources relating to maritime business at the earliest ages possible, helping them to form latent career interests which may be developed and activated into positive academic and career choices in later life. It is also important that careers advisers are fully informed about careers in maritime business, as they provided an important source of information for female students. Professional and other bodies have a role to play in supplying more industry specific careers information for schools, and school visits to industrial and business premises provide first-hand experiences for young people.

Although 'love of the sea' was the major initial attraction of studying Maritime Business at university, basic employment concerns were increasing amongst second-year students. Course reputation proved an important influence in choosing where to study, with a 'world-wide reputation' important to freshmen choosing particular institutions, although various work and social experiences were also significant influences on choices, along with a coastal location and the lure of good facilities. In a similar vein, poor course content was the major potential turn-off, along with low self-efficacy or perceptions of 'a bad atmosphere'.

One third of students in all the categories examined, claimed that nothing would have deterred them from undertaking study at university, and one fifth stated that they had not considered any other university. Such students may have been displaying a degree of career immaturity, or more disturbingly, the same lack of realism and eventually career commitment, which historically ended many sea-going careers prematurely. For their own personal commitment and career maturity to develop fully, not only existing students, but also applicants, should be encouraged to consider fully both alternative courses of action, and the downside of their preferred option. Ongoing work experience and careers education while at university can also increase career maturity and commitment. Naive 'love of the sea' or a desire to travel

are unlikely to be sufficient qualities to produce a high calibre employee capable of surviving and thriving in the turbulent competitive world of a dynamic global economy.

References

1. KING, J., 1997, Globalisation of logistics management: present status and prospects. *Maritime Policy and Management*, 24(4), 381–387.
2. PALLIS, A. A., 1997, Towards a common ports policy? EU-proposals and the ports industry's perceptions. *Maritime Policy and Management*, 24(4), 365–380.
3. MUNDY, M., 1996, Raw recruits or serious competition? *Port Development International*, BPA International, London, UK, December 1996/January 1997, 37–40.
4. KALLSTROM, L., 1997, Road traffic technology for ports. In I. Nuttall (ed.) *Traffic Technology International 1997* (Dorking, UK: International Press), pp. 301–304.
5. THOMAS, B. J., 1995, Manpower and employment issues. *Maritime Policy and Management*, 22(3), 239–253. p. 252.
6. EVANGELISTA, P. AND MORVILLO, A., 1998, The role of training in developing entrepreneurship: the case of shipping in Italy. *Maritime Policy and Management*, 25(1), 81–96. p. 93.
7. TALBOT, C., 1992, Evaluation and validation: a mixed approach. *Journal of European Industrial Training*, 16(5), 26–32.
8. BARR, N., 1997, Student loans: towards a new public/private mix. *Public Money and Management*, 17(3), 31–40.
9. WILLIAMS, G. L., 1992, *Changing Patterns of Finance in Higher Education* (Buckingham, UK: Open University).
10. KNAPPER, C. K. and CROPLEY, A. J., 1991, *Lifelong Learning and Higher Education*, 2nd edn (London, UK: Kogan Page).
11. THE CHAMBER OF SHIPPING, May 1996, *Statistical Brief, 4th quarter 1995*, (London, UK: The Chamber of Shipping), p. 10.
12. HMSO, May 1994, Safer ships, cleaner seas. *Report of Lord Donaldson's inquiry into the prevention of pollution from merchant shipping* (London, UK: HMSO).
13. McCONVILLE, J. and GLEN, D., 1997, The employment implications of the United Kingdom's merchant fleet's decline. *Marine Policy*, 21(2), 267–276.
14. McCONVILLE, J., GLEN, D. and DOWDEN, J., 1997, UK Seafarers: An Analysis. *The London Guildhall University Study*. <http://www.british-shipping.org/maritimeskills.htm>, pp. 1–8.
15. GARDNER, B. M. and PETTIT, S. J., 1996, A Study of the UK Economy's Requirements for People with Experience of Working at Sea, Cardiff University, 123 pp.
16. DEARING, R., 1997b, Options for financing higher education: modelling and policy analysis. Report 12, *Higher Education in the Learning Society*, National Committee of Education into Higher Education (London: HMSO).
17. DINWOODIE, J. and HEIJVELD, H., 1997, Ensuring quality managers in the marine industry: an analysis of the undergraduate decision to embark on marine studies courses. In O. K. Sag (ed.) *Proceedings of the Eighth Congress of the International Maritime Association of the Mediterranean*, Volume 3, Istanbul, Turkey, November. (Istanbul, Turkey: Istanbul Technical University Maritime Faculty), pp. 13.1.1–13.1.10.
18. DINWOODIE, J., 1996, The decision to study Transport at University. *Proceedings of the Chartered Institute of Transport*, 5(2), 46–54.
19. HIBBS, J., 1988, *An Introduction to Transport Studies*. 2nd ed (London, UK: Kogan Page).
20. DEARING, R., 1997a, Full and part-time students in higher education: their experiences and expectations. Report 2, *Higher Education in the Learning Society*, National Committee of Education into Higher Education (London, UK: HMSO).
21. HOLLAND, J. L., 1985, *Making Vocational Choices: a Theory of Vocational Personalities and Work Environments*, 2nd ed (Englewood Cliffs, NJ: Prentice-Hall).
22. VROOM, V. H., 1964, *Work and motivation* (New York: Wiley), p. 56.

23. TSAKOS, P. N., 1996, Shipping beyond 2000—The views of an independent shipowner; Reginald Grout Memorial Lecture, 1 May 1996. In: *The Proceedings of the Chartered Institute of Transport*, 5(3), 3–14, p. 7.
24. LENT, R. W., BROWN, S. D. and HACKETT, G., 1994, Towards a unifying social cognitive theory of career and academic interest, choice and performance. *Journal of Vocational Behaviour*, 45, 79–122.
25. HOPE, R., 1980, *The Merchant Navy* (London, UK: Stanford Maritime).
26. BOARD OF TRADE, 1970, The attitude of seafarers to their employment. *The Committee of Inquiry into Shipping*, Social Surveys (Gallup Poll) Ltd. (London, UK: Board of Trade).
27. FRICKE, P. H., 1974, *Social Structure of Crews of British Dry cargo Merchant Ships: A Study of the organisation and environment of an occupation* (Cardiff, Wales: Department of Maritime Studies, University of Wales, Institute of Science and Technology).
28. BOULTER, J. D., 1991, Recruiting: marketing the merchant navy, unpublished DMS project, Institute of Marine Studies, University of Plymouth, Plymouth, UK.
29. MOREBY, D. H., 1968, *Personnel Management in Merchant Ships* (London, UK: Pergamon Press).
30. MILLWARD, L. J., 1995, Focus Groups. In *Research Methods in Psychology*, edited by G. M. Breakwell, S. Hammond and C. Fife-Schaw (London, UK: Sage Publications), Chapter 18, 274–292.
31. ARNOLD, J., 1989, Career decidedness and psychological well-being: a two-cohort longitudinal study of undergraduate students and recent graduates. *Journal of Occupational Psychology*, 62, 163–176.
32. BOREHAM, N. C. and ARTHUR, A. A., 1993, *Information Requirements in Occupational Decision Making*, Employment Department Group, School of Education Research Series, no. 8 (Manchester, UK: University of Manchester).
33. KIDD, J. M. and KILLEEN, J., 1992, Are the effects of careers guidance worth having?: Changes in practice and outcomes. *Journal of Occupational and Organisational Psychology*, 65, 219–234.

Paper 3

SAFETY, ATTITUDES OF PRACTITIONERS TO UPDATING COURSES AND THE ROLE OF CONTINUING MARINE EDUCATION IN AN ERA OF LIFELONG LEARNING

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Abstract

The willingness of practitioners to participate regularly in updating courses is crucial to maintaining and enhancing their professional knowledge, competencies and skills. In order to minimise the risk of professional incompetence being cited as the cause of marine accidents, suitable courses must be provided in a guise which practitioners are willing to attend, and as a prelude to devising and providing courses, it is essential to understand how maritime professionals perceive the role of updating courses. A review of the perceived updating needs of practitioners from a range of industries is also presented as a benchmark. Results of a recent survey of the perceived professional updating skills requirements of postgraduate alumni from Masters level courses in International Shipping and Logistics at the University of Plymouth are reported, in which risk management emerged as a common concern. Their perceptions of the attractions and barriers to attending suitable updating courses are discussed, along with other concerns which they raised in this context. Finally, the paper concludes with a review of the implications of the experience at Plymouth and elsewhere, for ensuring that as many maritime professionals as possible are attracted to courses which maintain and enhance their skills base, thus reducing the risk of future marine accidents due to professional incompetence.

Introduction

The willingness of practitioners to participate regularly in updating courses is crucial to maintaining and enhancing their professional knowledge, competencies and skills. In order to minimise the risk of professional incompetence being cited as the cause of marine accidents, suitable courses must be provided in a guise which practitioners are willing to attend, and as a prelude to devising and providing courses, it is essential to understand how maritime professionals perceive the role of updating courses.

Up to 80 per cent of all marine accidents have been attributed to human error (Donaldson, 1994,72), and in turn most marine pollution (Donaldson, 1994, xxv). Although it is "always idle to seek to change human nature... the answer to the problem lies in working with it and seeking to provide incentives and encouragement for the adoption of the highest standards at every level." While Donaldson showed how a safety culture affording safety issues a high priority in both the boardroom and the ship was the surest way forward, the need to "encourage and support" the best companies in managing their responsibilities implies a need for updating courses to support them. Managers need educating in new risk management procedures in

shipping, no longer based on sets of prescriptive rules, but rather on risk-based inspections which guide maintenance priorities, risk based classification rules and Formal Safety Assessment (Matthews, 1999). Under this approach, the costs and benefits of proposed legislative changes are systematically evaluated in order to balance safety and cost concerns.

This paper explores models showing how continuing professional development (CPD) has assisted practitioners in other professions, and reports on a survey of the attitudes of postgraduate alumni from Plymouth shipping courses towards updating short courses. The role of such courses in providing the encouragement and support for both individuals and organisations which is needed to nurture a safety culture is also considered. The needs for updating courses are reviewed, reflecting organisational changes promulgated by a dynamic global economy, external professional stimuli including the need for CPD, and many hidden benefits to participants, including benefits to course providers as evidenced by a "Teaching Company Scheme". The challenges of an era of lifelong learning, including its benefits as evidenced by the "Work Keys System", issues of how to promote such schemes, and the need to provide adequate recognition of CPD are discussed. The methodology and details of a survey of the attitudes of Plymouth postgraduate alumni towards updating courses are outlined, and the results are considered in relation to the expressed preferences of alumni in terms of course content, the reasons why such courses might attract them, and any barriers to attendance which they perceived. Finally, ways in which the gulf might be bridged between what is professionally desirable and the existing CPD activity of those surveyed are considered, as a possible ways forward towards propagating a marine safety culture.

Continuing professional development in related professions

The impacts of external global economic, legal and technological stimuli which may occasion change in maritime organisations, with all their attendant risks of operational failures and even accidents during transitional implementation phases, are well known. One way to minimise such risks is to study and learn from useful models for implementing cultural changes in other organisations, elsewhere in the supply chain, which have been developed. Staff training plays a vital role in implementing organisational change, and attention to the behavioural elements of managing the dynamics of change in the supply chain is known to be crucial if an initiative is to succeed (Easton *et al*, 1998). For a new organisational culture to develop to match a new strategy, it is essential to be sensitive to and manage human resistance, and to enable people to develop and re-skill. Systems of working procedures need to be designed and adopted, different types of decisions may need to be made in different ways, new infrastructure involving new information systems may be required, and usually, ongoing services must continue to function whilst the new regimes are established, without any breaks in operations.

In order to begin to change an organisational culture, comprehensive change and development training programmes are needed, which commence with re-orientating key change leaders or change agents who will promote changes amongst their peers. As a priority, their group communication and presentational skills may need enhancing, in order to encourage them to lead discussions and feedback progress to senior staff. Change leaders need to be enabled to know when to intervene in the change process, implying that they may need training in organisational behaviour and the psychology of change. Eventually, as change leaders move into new positions, they will require broader leadership skills, and may also need to understand and be able to communicate with other skills groups who are also involved in the change process. Beyond the change leaders, all staff will require training in how to perform new tasks, and work with new personnel, and new performance and reward structures will need to be devised. Simulators and other advanced technologies may be able to fulfil some of the training functions where the costs of incorrect actions by operators may be catastrophic. At sea, where the risk of loss of life, or serious environmental or economic loss is very real, these approaches have proved invaluable.

In the engineering professions for example, external professional developments have forced substantial strides towards defining effective strategies for ensuring that successful continuing professional development (CPD) programmes are implemented (Senior, 1995). By promoting the ongoing maintenance and enhancement of professional standards, it is envisaged that the probabilities of professional incompetence being cited as the cause of operational failures should be minimised. In particular, the issues of attempting to establish a learning culture through the promotion of CPD are well defined. Problems of smaller organisations which lack the resources to promote such schemes, with the onus for competence acquisition becoming focused on individual employees, are overcome through public standard setting agencies which are required to ensure that standards are maintained. It is important to persuade individuals that CPD is not merely a response to change, but should be pro-active in driving the change process both within themselves and within their organisations. The promotion of CPD necessitates an appeal to both the professional responsibilities of individuals to seek to continuously update, and the provision of an attractive and flexible set of activities through which to do so. The issue of setting standards involves individuals managing their own CPD, but also recording their achievements and supporting the learning of others where possible. Activities that contribute to development are wide-ranging and can include making presentations and writing papers, attending professional meetings and seminars, attending formal courses or distance learning programmes, and self-study or special secondments. Although various accreditation processes for measuring the attainment of learning outcomes are possible, the issue of recognition, and hence providing sufficient motivation with which to encourage all professionals to participate, has been problematic. Especially where membership of a professional body is not integral to the right to practice in an occupation, it is essential that each employee feels that they can both define their own CPD activities and requirements, and also own the whole process, if it is ever to be really effective. The key to the success of a scheme depends on being able to motivate all professionals to participate and continuously upgrade themselves through participation in the scheme.

Hidden benefits, over and above the tangible increases in the competencies of course members or reduced accident risks to the organisations employing them may accrue to all stakeholders participating in the updating process, including academics or other providers of courses. Some experience relevant to specialist marine education has been reported in partnership schemes, including one between the local university and the Devonport Royal Naval Dockyard at Plymouth (Burns, 1996). Under this so-called Teaching Company Scheme (TCS), three stakeholders including the company, the individual and the university were defined. Benefits to the latter, although arguably less tangible than to the other two participants, were substantial. New teaching materials acquired included a rich source of case studies and tutorial examples, and the company also provided visiting lecturers and hands-on problem contexts within which to contextualise challenging student projects. TCS Associates were encouraged to register as postgraduate students on higher degree courses, with the courses themselves benefiting from being more closely structured around workplace requirements, where modules of study were readily repackageable into flexible formats available for other users including short courses. In addition, there was scope for Associates to register for doctoral research, thereby raising the profile of the department concerned. Involvement of academics in the scheme contributed to their staff development, in addition to providing experience to assist in other course developments at the university, financial benefits through equipment transfers, and welcome contributions to academic salaries. The TCS provided one scheme under which, although the number of Associates gaining direct training was finite, each partner gained substantial tangible benefits raising their operational competence, plus other less tangible benefits.

The "Work Keys System" was devised in the United States as a response to the realisation that "education and adult life, especially work, are consecutive rather than concurrent" (Ferguson, 1995). In a lifelong learning environment, it is understood that traditional educational programmes must adapt to prepare their participants more fully for the world of work, and also that new partnerships will be needed between industry and institutions of higher edu-

cation to cater for the ongoing educational needs of employees. Academic diplomas must cease to be viewed as entry-level gateways to employment, where a gap has developed between the occupational skills requirements and the outcomes of educational courses. In a new tripartite arrangement, academics must be able to develop flexible approaches to learning which match employees' specific needs; employers' roles in defining curricula are likely to increase, and learners need to know what is required of them. The Work Keys System was devised partly to encourage a common meaningful vocabulary between industry and academia. In this interaction, terms were redefined, where the term "reading" for example ceased to represent a literary exercise based on impressions and opinions, becoming rather an exercise in the use of information in a problem-solving setting. Following on from this dialogue, workforce skills could then be upgraded. Job profiling, a process in which the various skills and competencies demanded by a particular job are defined, was linked with assessments of the skills and abilities of potential incumbents of the role, before targets for their instruction were defined which would enable them to fulfil this role. In the process of recording participants' progress during training, information on the skill levels attained by individuals was reported. Reporting also included normative reports of group performance, and any additional information which linked the individual's choices, experience and reports of any help they might need in acquiring new skills to gain suitable employment. Using this System, as new skill requirements are defined by the workplace, so new sets of skills can be recognised and refined, and the potential demands on individuals seeking to acquire them can be communicated to workers. These skill sets include both generic and job-specific skills, but at any level, clear progression to the next level is evident for all that seek to attain them. For any individual in the scheme, learning becomes a lifelong process, maximising their ongoing operational competence, and minimising their accident potential.

Unless employees can be encouraged to participate in training, their risk potential may increase. The problem of promoting lifelong learning has been addressed through a tripartite strategy of co-operation between a university, individuals and a company (Ojala, 1994). A "competence to develop" strategy was afforded by the link between the university and the company; "strategic capabilities" were provided by links between the university and the individual through lifelong learning, and "operational capabilities" were provided by links between individuals and the company. Lifelong learning can represent a form of human recycling in which the individual is reinvigorated, although in the times of increasing job uncertainty, public accreditation of company training schemes becomes essential. In order to establish the partnership between organisations and universities, they need to work jointly together to establish strategic training needs, and analyse the training and education requirements. Counselling may be required, as may collaboration with individuals, before decisions are taken regarding the channels with which to distribute the educational process. Networking also assists in helping industry to define its ongoing training requirements, before eventually developing effective educational services and finally finding acceptable means of accrediting them. Taken together, these approaches could promote lifelong learning through satisfying the development and updating requirements of all three parties involved.

The issue of defining a suitable framework for recognising lifelong learning has been debated and operationalised even at the most august universities (Hendry and Waltham, 1998). Traditional provision of short courses, which afforded technology transfer and hence development of a competitive advantage for businesses at Cambridge University has been supplemented by attempts to develop longer-term relationships with organisations. The process of developing rather than training employees involved them in managing their own learning, and devising a system for recognising such learning proved essential. It was necessary to develop flexible learning programmes which were not dependent on external academic qualifications, which were tailored to the needs and study patterns of particular individuals. A "Mastery of Best Practice" system, company-specific, recognised the need for individual development plans, where each employee set their own targets, prioritised their development needs and identified their learning opportunities. Individual learning needs were defined in relation to corpo-

rate strategic objectives, and the employee's role in relation to them, accompanied by company-wide competencies defined in precise developmental needs terms. Courses were supplemented by on-the-job training, self-study and discussions aimed at developing skills and attitudes. Although awards for achievement did not afford global academic accreditation, they did have meaning within the corporate environment, and could be supported by an academic institution. Those participating in such schemes created their own specialist knowledge, and academics merely facilitated such a process, enabling professionals to become part of the community of scholars, rather than mere erstwhile observers or visitors to a traditional short course. The commitment and ownership of individuals and companies to such personalised learning is surely of the type needed to minimise accident risks.

Methodology

In an attempt to devise an updating short course suitable for Masters Level alumni who had graduated from courses such as that offered in International Shipping and Logistics at the University of Plymouth, an international survey of the current perceived training requirements of former students was conducted. A questionnaire was mailed out to almost 300 alumni who had been registered on courses which had run since 1975, although the contact addresses of many of them were inevitably no longer current. The format of several of the questions asked was open-ended, enabling respondents to express answers in their own words, and this necessitated qualitative data analysis of these replies using quantitative content analysis (Millward, 1995). This process involved analysing the verbatim statements of respondents and "tagging" particular concepts, and then recording and reporting the frequency with which each concept was alluded to, with statistical analysis proving inappropriate beyond reporting these basic frequencies. By way of contrast, the format of questions addressing other issues, pertaining to the potential content and topics which might be covered in short courses, involved respondents in being requested to rate particular subject areas and topics within them as being of high, medium or low interest. Data reported here included the combined percentages of responses in the former two categories.

Survey

The survey requested details of :

- short courses attended by respondents in the last two years
- the main reasons why respondents had attended short courses
- the main reasons why respondents might wish to attend short courses provided by their old university
- professional bodies which respondents were members of, and any attendant CPD requirements
- their preferred location, duration, timing and mode of attendance at short courses
- ratings of the desirability of the potential subject matter and content of short courses which they would wish to attend, included under six broad headings, each subdivided in turn into 10-12 topics.

Preferred course content

In order to assess the topics of interest to potential attendees at short courses which might be provided, they were asked questions about actual courses which they had attended recently, and the characteristics of courses which they might seek to attend in future. Of the 31 alumni who responded to the survey, half had attended some form of short course in the previous two years, with an average attendance at one course per year each, and a wide range of course providers had been involved. The introduction of ISM codes was the major single theme of courses which they had attended, affecting some 40% of those who had been on courses. The

topic of auditing was the second major theme, covering 25% of courses attended, but otherwise the lists of course topics attended were very broad. Half of the courses which they attended had lasted 2 days, with the rest of between 1 and 5 days duration, and employers had funded attendance at two-thirds of the courses.

Details of the content of courses which potential attendees might be attracted to are shown in Tables 1 and 2, where the percentage of respondents who recorded topics as being of either high or moderate interest to them is shown. This information gives some indication of the concerns which they were feeling at the time of their response, with concerns related to risk predominating. In the financial section, concerns over a single European currency and falling interest rates may have influenced responses, but with both implying uncertainty over profit

Table 1. The percentage of respondents as least moderately interested in the topics shown.

1. International Financial Management for Shipping	% of respondents
Hedging techniques for currency risk management	88
Commercial risk in international shipping	71
Interest rate risk management	70
Hedging shipping market risk	67
Credit risk in shipping	61
Forwards, futures and options in currency risk management	59
Forward Freight Agreements	55
Currency risk management in liner shipping	50
Hedging bunker price risk	45
2. Business Systems and Operational Research	
Risk analysis in shipping and logistics	87
Techniques for structuring business problems	78
Updating of spreadsheet skills	69
Soft systems in shipping and logistics	65
Game theory and shipping business	65
Systems dynamics in shipping	64
Investigating shipping problems in developing countries	61
Techniques for routing and scheduling	61
Decision theory in shipping business	54
Modelling congested systems	44
Using mapping techniques to structure problems in logistics	43
3. Strategic marketing and management in shipping	
Strategic choice in shipping	82
Strategic evaluation in shipping	82
Strategic direction and strategy formulation	81
Information and control in international management	77
Market auditing / SWOT analysis	77
Human resources management in shipping	73
Strategic implementation and control	73
Planning, policies and strategies in shipping	68
Organisation and structures in shipping companies	59
Theory and practice of ship management	59

Table 2. The percentage of respondents as least moderately interested in the topics shown.

4. Issues in shipping law % of respondents	
General average	76
Marine Insurance	75
Arrest of ships and maritime liens	75
Limitation of liability	75
Ownership, registration and mortgaging of a ship	71
Admiralty Jurisdiction	71
Salvage	71
The ship within public international law	67
Port State Control	67
Safety conventions	66
Pollution conventions	66
5. International Logistics	
Global supply chains	61
The impact of policies of world trade organisations	60
Enterprise resource planning	57
Through and combined transport	57
Law of international "non-marine" transport.	56
Third party logistics	52
Logistics in developing countries	48
Insurance in international logistics	48
Structure and organisation of marketing channels	47
Multinational corporations vertical marketing systems	43
Logistics in Eastern Europe	43
6. International Physical Distribution	
Law and legislation in the handling and movement of goods	86
International trade communications systems	67
Commodity characteristics and classification	67
Hazardous and dangerous goods.	66
The law, technology and commerce of intermodalism	66
Developments in handling systems and unit loads	62
Materials handling management	58
Materials classification systems	52

margins they could potentially stimulate cost cutting measures with implications for accident risks. A concern to quantify such risks, in turn demanding an ability to structure complex problem contexts, and upgraded spreadsheet skills is also apparent, along with an interest in game theoretic computations of the payoffs associated with particular strategies. Logically, given these concerns, the need to be able to formulate, evaluate and make strategic marketing choices with which to be able to respond to these uncertain conditions is also a priority. Associated legal issues, including liens, insurance, general average and liability are merely extensions of the same basic concern to manage the initial sources of risk. Related to this are concerns over the legal elements of handling and moving goods, but other elements of international logistics are more limited concern in this particular context. This prime concern of managers to equip

themselves with the skills required to handle risk represents a genuine willingness to ensure that the conditions under which accidents can be minimised are likely to pertain. The responsibility of course planners is to harness this willingness and find the most effective means towards enabling managers to acquire and hone new skills as quickly as possible. Part of this process involves establishing the factors which will entice them to attend suitable courses.

Table 3. Some verbatim replies to why alumni wished to attend short courses.

<u>What are the main reasons why you wish to attend short courses?</u>
The frequency of responses are shown in parentheses (3).
To keep up with recent developments (7)
To improve my know how (6)
To gain new professional knowledge (5)
A need for ongoing training and academic support to my professional career
I only have time to attend short courses to upgrade knowledge
Updating in management techniques and issues
To develop a higher professional standard
To catch up with innovations in the shipping industry
To get an update on the shipping environment, improve my knowledge of stocks, and broaden my views on shipping business
Direct added value to my employment
Corporate reorganisation and a new IT system created a need for training
Part of my graduate training includes a course preparing me for examinations of a professional body.

Perceived benefits of attending courses

Table 3 summarises some of the verbatim responses and qualitative content analysis of replies by alumni wanting to attend short courses. Although a desire to update knowledge featured as the prime concern, the desires to deepen and broaden their professional knowledge and understanding were also apparent. In some cases, all three were present for one individual, although these were not necessarily the causal reasons for seeking to attend courses. Cases were cited of organisational restructuring occasioning a need for new skills, a desire to add value or be more effective in their employment, or a desire for professional development or achieving the professional requirements of a professional body. These reasons for attending updating courses indicate that course providers must cater for a broad range of individual needs, creating a challenge to channel them into an effective and attractive format which is able to meet these needs.

One third of respondents were currently members of a professional body, of whom only one half were undertaking some form of CPD, with this activity including attendance on courses, giving lectures and seminars, research activities and private study. The gulf between the realities of the actual CPD activity of practitioners as surveyed here and desirable levels as indicated in the literature review, indicates a need for initiatives to raise awareness of both the importance of such activity, and the ways in which it might be conducted among professionals in marine studies.

Bearing in mind that this was a survey of alumni, and hence respondents were already familiar with activity at Plymouth, many were attracted by the desire to return to this particular learning environment in order to satisfy their current perceived study needs (Table 4). Of

Table 4. Content analysis of the reasons for wanting to attend short courses at Plymouth

What are the main reasons why you wish to attend short courses in Plymouth?	Frequency of responses.
The university has a good reputation in shipping	10
The university offers me an opportunity to acquire new knowledge through providing high quality courses	8
I am familiar with the university, and my earlier experiences were good	8
To revisit the university and renew old friendships	6
The university offers me good facilities	4
It is a pleasant location	4

over riding importance was the technical reputation of the university in shipping as an academic discipline, acknowledging a desire to receive high quality tuition. The same point was evident amongst those seeking to acquire new knowledge, who expressed a concern to participate in what they perceived to be a high quality learning environment. The issue of familiarity with the learning environment was expressed in two ways, including those whose earlier experiences had been good, and those who were more influenced by a social desire to revisit and renew old friendships. Finally, and of less moment, were perceptions of good facilities or a pleasant location within which to study. Taken overall, even for returning alumni, these perceptions indicate that the perceived technical competence of the institution was considered to be paramount, including issues relating to its subject reputation, and the quality of lecturers and facilities. Issues of personal familiarity were important but secondary, and perceptions of a pleasant location were alluded to by some respondents. Although knowledge of the attractions of courses to managers is an essential input to their design, it is also essential to know what the barriers are which might deter potential attendees, in order to ensure that participation is maximised.

Perceived barriers to attending short courses

Cost, including both travelling and other costs, was the most frequently stated barrier which might deter respondents from attending short courses in Plymouth (Table 5), concerning almost half of those surveyed. Second to this, the distance required to travel to the university was significant, although many had attended short courses overseas previously. An inability to take time away from the workplace was linked with the issue of cost for some respondents, in turn linked with issues of explicit course relevance for a couple of alumni. Taken overall, it is clear that not only has a course to be perceived as "essential" by potential clients, but the overall package, involving time away from the workplace, international travel and course

Table 5. Content analysis of barriers to attending short courses at Plymouth.

What are the main barriers to attending short courses in Plymouth?	Frequency of responses.
The cost of attending courses	15
The travelling distance to the university	12
Inability to take time away from my workplace	7
I can only attend if courses are absolutely relevant to my work situation	2
There are no barriers at all	2
	1

fees must be viewed as representing good value for money for them to realistically consider attending. This again raises issues of a need to market courses clearly, and to ensure that once in the classroom, the maximum use is made of what precious contact time is available in order to raise its behavioural effectiveness in the workplace.

Conclusion

This paper examined the attitudes of one group of practising postgraduate alumni in shipping in order to explore their perceived requirements for updating short courses. In seeking to work with, rather than change their human nature, as advocated by Donaldson, this study explored the possible content of courses which they would wish to attend, and investigated some of the attractions and barriers to their attendance at suitable courses. Expressed topics of interest included elements of risk assessment and management, including financial considerations, methods for exploring complex problem contexts and quantifying risks, spreadsheet approaches to risk analysis, and issues of strategic marketing were also raised. The main barriers which might prevent managers from attending courses included time, distance and cost, each of which imply a need to develop either more flexible modes of delivery for CPD, or special incentives to encourage attendance on courses if practitioners' participation rates are to be increased. More flexible forms of CPD could include workplace staff development, which might affect the commitment and ownership of the change process by individual employees, or distance learning formats for courses, which could dilute their impact on developing social skills or attitudes which may reduce their behavioural effectiveness in accident reduction terms. If it is desirable that more shipping managers from a broader functional base attend formal courses regularly, then the ongoing monitoring and accreditation of practitioners in particular CPD activities, in turn stipulated as requisite conditions for the granting of ongoing certificates of professional competence is possible. However, by reducing the personal ownership of such activity by individuals, this approach may also reduce its impact on operational effectiveness. Alternatively, if the cost-effectiveness of attendance at courses could be demonstrated, financial incentives possibly in the form of grants to attendees or their employers awarded by national or supranational bodies might raise participation rates.

The impact of course attendance on the workplace effectiveness of individual managers and hence accident reduction rates has not been discussed here, but the general positive effects on morale and motivation are likely to have knock-on effects in reducing human errors due to low morale or outdated knowledge. If CPD in an era of lifelong learning could be regarded as proactive, leading the organisational development and change processes, its perceived attractiveness would also rise. Experience in other professions indicates that a dialogue is required involving academia, industry and individuals from late adolescence to retirement in redefining the nature and content of educational provision for the maritime industries. Teaching Company Schemes for aspiring managers have proved beneficial to all parties involved and customised workplace staff development schemes have also proved effective, although the issue of finding appropriate recording and recognition of training remains. There are considerable grounds for optimism concerning both the range of CPD schemes which could be devised and the willingness of individuals to participate in them, and their potential for accident reduction. However, the precise mechanisms required to mobilise the resources needed to translate these schemes into positive CPD activity, and the form of any sanctions applicable to those failing to comply must be defined before the benefits of reductions in operating losses are reaped. One part of the process of developing an effective maritime safety culture will surely involve individuals engaging in lifelong learning regimes, with regular participation in short courses forming a useful component.

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References

- Burns, R. (1996). Maximising the benefits and TCS partnerships. The experience of the University of Plymouth. *Industry and Higher Education*, Vol. 10. No.2. April, pp. 117-120.
- Donaldson, Lord (1994) Safer Ships, Cleaner Seas. Report of Lord Donaldson's Inquiry into the Prevention of Pollution from Merchant Ships. HMSO, London.
- Easton, R., Brown, R. and Armitage, D. (1998) The dynamics of change in the supply chain: Translating supply chain strategies into action. Chapter 28 in Gattorna, J. (ed.), *Strategic Supply Chain Alignment: Best Practice in Supply Chain Management*, Gower, Aldershot, England.
- Ferguson, R.L. (1995) Workforce improvement and lifelong learning. A new paradigm for education and training in the USA. *Industry and Higher Education*, Vol. 9. No.4. August, pp. 241-247.
- Hendry, E. and Waltham, M. (1998) New shoots from old roots. Continuing professional development at the University of Cambridge. *Industry and Higher Education*, Vol. 12. No.3. June. pp. 172-177.
- Matthews, S. (1999) Classification: what's the risk? *Lloyds Ship Manager*, February, Lloyds, London. pp. 47-50.
- Millward, L.J. (1995). Focus Groups. In: *Research Methods in Psychology* (Breakwell, G.M., Hammond, S. and Fife-Schaw, C. eds), Chap. 18, pp. 274-292. Sage Publications, London.
- Otala, L. (1994), Implementing lifelong learning through industry - university partnership. *Industry and Higher Education*, Vol. 8. No.4. December. pp. 201-207.
- Senior, C. (1995). Strategies for professional development in engineering. *Industry and Higher Education*, Vol. 9. No.4. August. pp. 236-240.

Also see:

Dinwoodie, J. (2000b, Work 4, *op. cit.*), Ch.5, 63-96.

Quantitative Analysis of Evolving Perceptions of the Study Decision.

Section B.

**Developing instruments to analyse the
decision to study at Plymouth.**

Paper 5



ENSURING QUALITY MANAGERS IN THE MARINE INDUSTRY: AN ANALYSIS OF THE UNDERGRADUATE DECISION TO EMBARK ON MARINE STUDIES COURSES

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ABSTRACT

The success of the marine industry world-wide in the 21st century will depend on the ability and professionalism of its senior employees, with the responsibility for maintaining and raising future standards resting with individuals currently in university marine studies classrooms. This paper aims to explore the process whereby groups of young people, of multinational origin, chose to undertake higher education on marine studies courses at the University of Plymouth, in relation to their perceptions of broader aspects of careers in the marine industry. It considers the implications for the recruitment and education of high quality entrants to the marine industries. After reviewing literature relating to how young people choose to embark on marine careers, the paper reports on a survey of the career perceptions of undergraduates and applicants in marine studies at Plymouth. Qualitative techniques, including content analysis of the open-ended responses of individuals to questions ensured high construct validity.

1. BACKGROUND

International shipping businesses, supported by related services in finance, insurance, warehousing, ports, shipbuilding and repair, legal

services, ship and cargo brokers, and offshore exploration and exploitation of oil, gas and minerals, commercial fishing and marine sport and leisure, all require skilled personnel. In 1994 in the UK the Chamber of Shipping [1] reported a net contribution to the balance of payments of almost £ 1 billion. Marine insurance, banking, P&I clubs, legal services and marine brokers also demand highly trained and specialist expertise.

People in marine related jobs are either employed ashore or at sea, operating ships, fishing, or serving offshore production units. For jobs at sea, professional qualifications traditionally demanded training at nautical colleges, as deck officers or marine engineers before gaining practical experience at sea. IMO is concerned with establishing international mechanisms for controlling education in order to ensure high standards of maritime personnel, for safety reasons, to prevent injury and loss of life [Lopez, 2, 37]. On attaining full qualifications, possibly after a decade of post nautical college experience, many staff in their late twenties sought on-shore employment, where some jobs require sea-going expertise, but others do not. The problem of particular concern in the United Kingdom is that as the number of seafarers has declined, fewer UK nationals are available to fill jobs where professional experience is considered essential, forcing increasing dependence on the continuing availability of

other nationals [HMSO 3,4]. The Chamber of Shipping [5] reported 33,000 UK officers employed at sea in the mid-1970's, compared with 7,721 in 1994, of which only 5 % were female. Another trend has been to upgrade the vocational maritime education and integrate it into ever higher levels of education, away from certificates and diplomas to marine based degrees. Ideally, Spruyt[6] foresees graduate shipping managers aware of shipping traditions, who welcome new ideas and have the courage to find solutions to chronic problems, in an industry that operates globally but which is regulated nationally. They must be enthusiastic over total quality and zero-defect management objectives, ready to take control of public image building, reverse the industry's aversion to training, keen to work in multicultural teams, think strategically in their relationships with governments, markets and trade unions, and believe in profitability as an achievable objective for an ethical, quality oriented, caring industry. Tsakos[7] questions whether entrants to degree courses in marine studies will meet these expectations after completing their studies? Are their perceptions of the demands of a career in the marine industry realistic? Will the marine industry be able to attract sufficient able recruits into ships and shipping related professions?

This study aims to explore the process whereby young people chose to undertake higher education on marine studies courses at the University of Plymouth, in relation to their perceptions of broader aspects of careers in the marine industry. After briefly reviewing aspects of literature relevant to the choice of marine and other careers, Section 3 outlines the methodology used in a survey of career perceptions of marine studies undergraduates and applicants. Their responses, analysed in Section 4, relate to career choice processes including sources of information used in making decisions, perceived attractions, shortcomings, and requirements of career openings they have considered, and the influence of family and friends. Section 5 concludes by noting the

need for improved careers education, along with measures to redress the negative stereotypes associated with marine careers.

2. Literature review of perceptions of careers in the marine and other industries.

Literature drawn from both marine sources and vocational behaviour is pertinent to understanding decisions to engage in marine studies at university. Relevant themes include early surveys of perceptions of marine careers [Gallup, 8; Frickle, 9], careers directories [Hibbs, 10; Hope, 11], occupational preferences [Boulter, 12], stereotypes [Arnold, 13], career commitment [Blau, 14], and how decisions to study at university are made [Dinwoodie, 15].

Gallup [8], investigating why seamen left the merchant navy, provided insights into career choice, finding that for example, only among deck officer ranks, did the majority go to sea planning a life career, and that a high proportion of married seafarers had a history of going to sea in both partners' family. Marriage and family reasons outweighed pay as reasons for leaving, and working conditions were not a major problem, but job insecurity deterred deck officers from encouraging others to go to sea.

Public perceptions of the shipping industry reflect the demise of glamour in shipping, attendant upon its general contraction and reduced prestige. Frickle [9] exploded the myths of traditional stereotyped images of seafarers, noting that of travel as a reason for going to sea, under three hours was spent ashore each day in a foreign port. Pay was no better than other occupations, but paid board and lodgings made it seem so. Hibbs [16] noted that 'ship's officers report that their day's work is ever-increasing routine'.

Frickle [9] observed that where contact with mariners in their workplace was limited, public knowledge could only be gained through the stereotype. Shipping literature emphasised

travel, adventure, status and responsibility but not the realities of shipboard life. In the workplace, cognitive dissonance may result from unrealistic expectations of role or image, which can prematurely end careers at sea, where officers with relatives at sea were less surprised by the nature of their work, than those without them. Stereotypes consist of generalised notions of people in particular groups, and once formed, they tend to resist change by encouraging only information which is consistent with them to be recalled [Arnold, 17]. In this situation, accessible and accurate careers information is essential to counter any negative stereotypes.

Boulter [12] studied how teenagers in coastal and inland areas made career choices and perceived the status of merchant navy officers, and how knowing someone at sea influenced perceptions of potential careers in the merchant navy. Such careers were perceived as satisfying needs for travel, responsibility and adventure with pay perceived as being more adequate by coastal respondents. Someone who knew a seaman was more likely to go to sea, and status ratings of seamen were significantly higher for those knowing a seaman than others. Factors influencing career choice were ranked as enjoyment, salary, security and prospects, social contact, responsibility and adventure. Attractive elements of the merchant navy were salary, responsibility, stability, and prospects with too long at sea, danger, poor living conditions and seasickness least attractive. He concluded by noting that apart from family and friends, the media was the most powerful influence and often negative, reporting disasters.

3. Methodology

A limited literature relating to the attractions of careers in marine studies [Gallup,10; Boulter,12] provided one data source which may influence young people in making career decisions. However, as this literature is often

insufficient to define even the parameters relevant to many decisions, exploratory qualitative research methods were employed. The major element of original data collection involved a survey, using a structured questionnaire with open-ended questions, designed to stimulate interest in the process of how to think about careers awareness by raising new or difficult issues [Kidd & Killeen, 18].

The survey was administered, to all persons present in particular classes in winter 1995-6, generating a sample of applicants visiting university prior to matriculation, and undergraduates in Stages 1 & 2 of the course. Results are discussed in relation to applicants (A), Stage 1 freshmen (S1), and Stage 2 (S2). Combined samples of Stages 1&2 are referred to as 'students' or 'undergraduates'.

Responses were analysed using quantitative content analysis of each individual's detailed responses to open-ended questions. Sample sizes are sufficient to establish the major issues of concern in particular contexts [Breakwell,19], although inference of statistical differences between groups is often inappropriate beyond simple description, given the open-ended response format. In this context, any stated proportions are best interpreted as single sample rather than population estimates. Non-parametric inference of correlations using Spearman's rho statistic, enabled between group comparisons of the distributions of the ranked percentages of students highlighting particular issues [Mendenhall,20], shown in Tables with * (95%) or ** (99%) confidence.

Table 1. Characteristics of the sample.

Parameter \ Group:	Applicant	Stage1	Stage2
Sample size	34	35	69
Median age	17	19	20
Aged 25+ (%)	6	9	20
Females (%)	21	20	7
Work experience (%)	47	38	22
Full time work (%)	0	3	9
Casual work(%)	29	29	3
Short term work (%)	18	6	10

4. Results

Table 1 summarises some characteristics of the sample surveyed, showing the proportion of students claiming relevant work experience to be inversely related to time spent at university. This may reflect a shift in perceptions from applicants who held casual work experience in high esteem, to more advanced students who had reappraised early experiences in the light of more focused choices, and later discarded them as irrelevant. Data collection methods may also be an issue, in that self-completion questionnaires, used here, may underestimate proportions claiming work experience but interviews enable responses to be clarified [Dinwoodie,21].

4.1. Careers considered by students and sources of careers information

An industry comprising several occupations, each with associated blurred images, may lack immediate appeal. Marine students may be committed as individuals to their profession through activities such as reading journals and attending professional meetings, where broad concepts of general work involvement or narrow job or organisational commitment are inappropriate [Blau,14]. Career commitment may vary with career-stage, including an 'exploration' phase where youngsters seek an interesting role but quickly choose another if it proves inappropriate. Career-decidedness is probably related to psychological well-being [Arnold, 23], in providing an identity and filter through which experiences in unexpected roles can be interpreted, and may encourage acceptance of demanding work situations, in order to achieve long term goals. Careers advisers stress the psychological benefits and importance of making appropriate career choices long before graduation.

Early commitment to transport may be underestimated by careers teachers [Hibbs, 24]. At Plymouth only 25% of marine students

failed to respond or had not considered marine careers, varying little by cohort (Table 2). The taxonomy of occupational preference groups are not necessarily mutually exclusive, where for example students interested in maritime business may end up as managers or brokers. It is also possible that applicants sampled were more science and technology oriented, or that after matriculation, shifts in interest towards business as increasingly realistic personal expectations and knowledge of job-entry requirements developed.

Career choices focused with increasing exposure to study, as the proportion of respondents choosing general occupations fell, and those choosing more precise categories rose. Import / export/ trade, port management, insurance, ship manager and broking appear to be major attractions as graduation looms. One measure of vocational maturity is the willingness to state a second career indicating internalisation of a "process of negotiation of possible future selves which young people should be encouraged to explore" [Kidd & Killeen, 25]. This increased with course-stage where when asked to state alternative career choices, applicants and freshmen showed greater non-response than Stage 2. Positive responses were subjectively classified as realistic or otherwise, depending on the specific qualifications and experience of students. Realistic alternatives appeared proportionately greater for applicants due to more individuals with specific scientific backgrounds, but some were highly unrealistic. However, a smaller percentage of applicants were willing to consider different areas of work in the marine industries than those nearer graduation. In addition, the proportions willing to consider general, including non-marine careers, rose as graduation approached. Overall, the profiles of applicants and students were inversely correlated in statistical terms. This pragmatic response signifies a need for ongoing marine studies careers education which encourages students to adopt a process approach to making realistic decisions about their possible future selves.

Table 2. Likely careers & information sources

	Applicants		Stage1	Stage2
<u>Careers considered in the Marine Industry.</u>				
None	23	27	25	
Marine science	32	0	0	
Marine technology	18	0	1	
Royal Navy	12	0	0	
Business / shipping	6	9	6	
Maritime law	0	9	3	
Ship manager	0	15	10	
Ship broker	0	11	10	
Marine leisure	0	6	3	
Port management	0	0	10	
Import / Export / Trade	0	6	16	
Insurance	0	3	10	
Deck officer / engineer	6	3	6	
Rho. A/S1 -0.60* A/S2 -0.76** S1/S2 0.49				
<u>Possible second careers in the Marine industry.</u>				
None	41	40	16	
Realistic	38	11	20	
Unrealistic	6	3	6	
Different marine jobs	9	17	27	
Very general	6	29	19	
Not interested / not sure	0	0	12	
Rho. A/S1 0.79 A/S2 0.46 S1/S2 0.43				
<u>How would students find out about careers?</u>				
No reply	21	48	25	
Books	26	26	13	
Marine journals	12	14	30	
Job advertisements	3	9	14	
Central admissions	6	0	7	
Prospecti	27	0	7	
Attend presentations etc	18	17	13	
Computer packs / media	6	0	2	
Corporate recruitment	0	6	6	
Rho. A/S1 0.24 A/S2 0.22 S1/S2 0.68*				
<u>What information are students aware of ?</u>				
No reply	21	34	13	
Library	44	34	46	
Careers office / service	12	20	26	
Companies	0	6	16	
Letters	0	9	7	
Computer / telephone	9	9	3	
Careers adviser	17	6	3	
Lecturer / teacher	6	6	6	
Buy a magazine	7	0	1	
People in industry	21	6	3	
Rho. A/S1 0.32 A/S2 0.04 S1/S2 0.76**				

Sources of careers information. Non-response in surveys might signal a need for career guidance, where limited information may limit occupational awareness [Boreham, 26]. Low self-efficacy, involving doubting one's ability to perform a task, or belief in an external locus of control where events are allowed to dictate decisions, might be less overt causes. Non-response rates to questions of how to investigate marine courses and careers reflect the immediacy of the issue, being more pressing for applicants and Stage 2 than Stage 1. Non-response in describing perceived sources of careers information among applicants and Stage 1 may be reduced by improved knowledge of where to seek information by Stage 2. A significant proportion of respondents would find out about courses and careers in the marine industry by physically attending interviews, presentations and counselling sessions, but its importance decreased with course-year. 'Books' also declined with course-year being replaced by industry specific sources including shipping journals. Beyond this, responses reflected concerns appropriate to individual circumstances, with job advertisements and company records and corporate recruitment increasing towards graduation. For university applicants, the prospectus outranked the Central Admissions System, existing students, local knowledge, computer packs and the media.

When describing what information they were aware of and how they would access it, libraries predominated followed by careers experts, but applicants' understanding of a careers adviser differed from that of the student advisory service. Further into the course, the proportions referring to 'people in industry' declined, while those identifying 'companies' rose. This may reflect a shift from the influences of friends on university applicants choosing careers, to firms who employ graduates seemingly impersonally. Views of Stage 1 and 2 were correlated statistically.

4.2. Attractions, turn-offs and requirements of working in the marine industries.

Career maturity implies a willingness to consider the negative aspects of choices [Kidd & Killeen, 18] but non-response rates to attractions of work questions were lower than on negative features especially for applicants, indicating immaturity or lack of awareness. Some careers teachers view careers in transport as short term experiences [Hibbs, 10] attaching greater importance to travel than pay and status, reflecting historic reasons for officers going to sea [Frickle, 27] including travel (41%), the only work available (22%) and always having wanted to (22%), rather than good pay (7% each).

Attractions of working in marine industries. In this sample (Table 3), which analysed up to two choices, travel and variety were the main attractions. Applicants were more interested in their subject and 'love of the sea', including research, marine sports or practical work seen as outdoors and challenging. However, basic factors, denied by applicants, burgeoned towards graduation, including 'pay', 'status / responsibility' and 'good prospects'. Stage 1 & 2 views were correlated, with specific choices of 'the job' and 'people' more important, involving a busy or dynamic working environment, 'freedom in work hours', 'organisational factors' and 'security'. Although travel is a major attraction of the marine industry, 'love of the job' and basic needs rose towards graduation.

Turn-offs to working in marine industries. Major traditional negative perceptions of life at sea included time from home (25%) and sea sickness (11%) [Gallup, 10], but in this study conditions of work, unsociable hours, boring work and poor prospects were highlighted. Traditional concerns were mooted more later in the course, involving basic issues of 'job insecurity', 'poor pay', 'away from home' and 'financial cutbacks', although bad weather and fear of drowning concerned some applicants.

Issues of sex, work culture and public image could be clarified in more class discussions.

Perceived cognitive requirements of marine careers. The most common perceived educational requirement of respondents' preferred jobs was a non-specific degree, within the two permitted responses, and career indecision accounted for most of the non-response. Stage 1 & 2 views were correlated, and with greater expectations of attaining graduate status and eligibility for graduate employment, they felt specialist degrees to be more important than applicants, who were content with general degrees, 'A' levels, or more knowledge of the job market. Perceived requirements for knowledge declined with study, but the proportions identifying business skills rose with study. Experience was important to freshmen but not applicants, and some quoted technical understanding and adaptability. These observations imply a need for flexible course structures to meet broad and changing aspirations.

Perceived affective requirements of marine careers. Jobs involve affective or emotional as well as cognitive elements. In this survey, three 'other skills' requirements of the preferred employment were analysed. Non-response was low for applicants but rose in Stage 1 reflecting the immediacy of cognitive concerns and career uncertainty in freshmen. Categories of response were, in decreasing frequency, perceived semi-cognitive requirements, inter-personal skills, personal skills and transferable skills. The modal stated semi-cognitive quality 'experience' rose with study, as did knowledge but 'technical understanding' fell. Some interpersonal-skills were quoted more frequently later in the course, namely, 'dealing with people' and 'communication', but 'groupwork' less frequently. Experience of university assignments involving groupwork may have raised awareness of the importance of communication and dealing with people. Personal qualities identified varied little by course-year, including in decreasing order patience, initiative, enthusiasm, responsibility,

Table 3. Attractions, turn-offs, skills and educational demands of work in marine industries.

	Applicants		
	Stage1	Stage2	
<u>Attractions of work in the marine industry.</u>			
No reply	0	11	7
Travel	21	34	36
Variety / interest / diversity	20	29	37
Research	20	0	0
Challenging	11	11	3
Love of the sea / ships	44	14	22
Outdoors	21	6	3
Busy / dynamic	6	0	9
The job	0	6	13
The subject	44	17	17
People - international	6	11	17
Prospects / opportunities	3	8	11
Pay	3	40	35
Status / responsibility	0	14	11
Sports / diving	15	0	0
Freedom in work hours	3	9	1
Organisational factors	3	9	1
Rho. A/S1 0.16 A/S2 0.20 S1/S2 0.80**			
<u>Turn-offs of work in the marine industry.</u>			
No reply	41	29	12
Unsociable hours	6	6	13
Conditions of work	32	14	27
Weather/ fear of drowning	21	3	10
Poor job prospects	12	11	7
Financial cutbacks	3	14	11
Away from home	3	20	9
Job insecurity	3	20	26
Poor pay	3	26	15
Boring	6	15	13
Sex bias	3	3	3
Work culture	3	6	7
Rho. A/S1 -0.33 A/S2 0.24 S1/S2 0.58			
<u>Perceived educational requirements of the job.</u>			
No reply	6	14	10
Any degree	33	29	46
Subject specialist degree	3	26	16
Higher degree	6	3	4
Professional memberships	3	9	1
Technical understanding	6	3	1
Experience	3	15	7
Knowledge	21	14	10
A levels	21	0	0
Business skills	3	6	17
Rho. A/S1 -0.07 A/S2 0.01 S1/S2 0.75*			

What other skills does this work demand ?

No reply	6	23	10
Technical understanding	6	3	1
Experience	15	28	20
Knowledge	9	17	20
Numeracy	9	3	1
Groupwork	20	6	6
Problem solving	9	0	3
Dealing with people	9	14	19
Business skills	0	0	12
Languages	0	9	6
Enthusiasm	6	11	6
Patience	18	9	11
Hardwork	9	0	4
Presentation skills	3	6	1
Initiative	12	8	7
Communication	6	3	17
Responsibility	9	0	9
Reliability	9	3	1
Rho. A/S1 0.24 A/S2 0.22 S1/S2 0.48*			

hard-work, reliability and confidence but should be developed by higher education. Transferable skills included 'business skills', numeracy and problem solving, language and presentation skills, which can also be taught.

The main perceived geographical locations of students' preferred marine jobs were coastal areas (43% of applicants), 'worldwide' and ports. More urban environments were quoted as studies progressed, including 'London' and 'large cities' (29% and 16% respectively of Stage 2, but only 0 and 3% of applicants). This may reflect a situation where more jobs in marine science are in coastal locations and there were proportionately more applicants interested in such jobs, or a developing realisation that much 'marine' employment may be city based. Other locations quoted included the North Sea, UK, Europe and Far East.

4.3 The importance of friends and relatives

'Significant others', including relatives and friends, may influence marine career decisions [Gallup, 10]. At Plymouth, 51% of marine

Table 4. The role of family and friends.

	Applicants Stage1 Stage2		
<u>% with family or friends in marine industries</u>			
No reply	27	20	46
None	32	23	7
Father / brother	12	34	19
Other relative	29	17	10
Friend	0	0	9
Rho. A/S1 0.30 A/S2 -0.30 S1/S2 0.20			
<u>How have they influenced you ? (%)</u>			
No reply	71	66	70
Grown up with influence	3	9	4
Increased my interest	12	6	15
Made me more realistic	12	6	10
I've worked with them	0	14	0
Rho. A/S1 0.05 A/S2 0.98** S1/S2 0.05			

students, including 59% of applicants, had no family or friends with experience of the marine industry (Table 4). Of students with contacts, there were fewer close relatives among applicants than in later Stages, but more distant relatives. and profiles of applicants and Stage 2 were correlated. A further 10% quoted friends, business contacts or previous work experience. Overall, 49% of Plymouth marine students had 'significant others' in the marine industry, of whom 65% (32% of the full sample) claimed some influence on their career decisions. Gallup [8] reported that for seamen, 54% had family who approved of the decision to go to sea, with only 19% openly hostile. Equally, 52% had discussed it with families, and 51% had friends who went to sea at the same time. Whilst no student in this sample had been discouraged from undertaking marine studies, the proportion of mariners' siblings not attracted to marine careers is unknown. The presence of mariners as 'significant others' resulted in, increased interest, growing up with the influence, greater realism and respect for the sea, and work experience. In comparison, Gallup [8] reported greater long-term commitment to naval careers from those related to seamen, due to more realistic expectations. Unstated influences include passive approval, or fresh-

men's unwillingness to overtly acknowledge insecurity after leaving home [Boreham, 26].

4.4 Why study marine studies ?

Why study marine studies? 'Love of the sea' predominated in the decision to study marine studies at university (Table 5) but concern over job prospects increased with time spent studying. This may reflect greater zeal in applicants attending 'Open-days' than students with more basic needs, or even retrospective adjustment of stated motives for study, as graduation looms. Stage 1 & 2 views were correlated on all course choice issues.

Why study at Plymouth? All applicants were attracted to Plymouth as a study-centre, and although some freshmen stating no particular attraction may have been concerned about workload or finances, by Stage 2 positive features had been reasserted. Course features were the largest group of attractions for all groups with reputation, quality or uniqueness highlighted. Course quality is an important marketing issue, but pride in the decision to study at Plymouth [Dinwoodie, 15] appears to grow over time. Physical attributes of location and environment were major reasons for wishing to study at Plymouth, predominating for applicants but receding for undergraduates, reflecting increasing familiarity and concern for course issues after matriculation. Proximity to home attracted more applicants than Stage 2, reflecting increasing financial pressures on new students. For a significant minority, the progression from 'near home' to 'a friendly atmosphere' typify the increasing familiarity with life in Plymouth. For others facilities, opportunities, and watersports were important.

Why study at other universities? Similar factors emerged when respondents were asked why they had considered study at other universities. Non-response may imply immaturity [Kidd & Killeen, 18] or reminiscences may have faded by Stage 2, but the need for

Table 5. Reasons for studying at Plymouth

Applicants Stage1 Stage2			
<u>What makes you want to study marine studies?</u>			
No reply	12	11	6
Love of the sea	51	40	42
The course / its reputation	6	8	7
Novelty	3	6	6
Job prospects	15	27	29
Previous course	9	0	9
Parental pressure	3	14	1
Rho. A/S1 0.55 A/S2 0.99** S1/S2 0.49			
<u>What made study at Plymouth attractive ?</u>			
No reply	0	23	10
Course reputation	23	27	35
Good / unique course	18	17	22
Location	17	14	16
Near the sea	26	11	6
Watersports	3	3	4
A nice place	18	11	13
Facilities	15	3	1
Near home	12	14	3
Friendly	3	14	14
Rho. A/S1 0.32 A/S2 0.44 S1/S2 0.81**			
<u>Why did you consider studying elsewhere ?</u>			
No reply	0	23	10
Similar course	23	27	35
Nearer home	18	17	22
A better course	17	14	16
Better social life	26	11	6
They accepted me	18	11	13
Rho. A/S1 -0.25 A/S2 0.03 S1/S2 0.61			
<u>What might put you off study at Plymouth?</u>			
No reply	51	23	30
Distance / remoteness	21	6	10
Nothing	3	9	4
Financial problems	6	3	1
Poor climate / weather	0	17	16
Poor resources	9	11	10
Poor atmosphere	10	22	26
Rho. A/S1 0.32 A/S2 0.27 S1/S2 0.99**			

continuing careers education is self-evident. Course considerations predominated, raising issues of quality and similarity of course, implying that factors such as location may have been the deciding factor. Of factors deterring study at Plymouth 'distance' the main concern of applicants, diminished once

committed to their decision, being replaced by 'climate', a 'catch-all' for a general mid-winter malaise. Broader concerns about finance, accommodation, employment offers and ability to cope were expressed in phrases such as 'if there is a poor atmosphere'. For many students the downside was imprecise, difficult to express and not immediate, but the attempt indicates greater career maturity and long term commitment than non-response, and needs to be encouraged.

5. Conclusion

The paper investigated the career choice processes of marine students, in an attempt to highlight how high calibre entrants might be attracted to the industry. Travel and variety were the main attractions of marine careers for applicants into higher education in this sample, but their long term commitment would increase if careers teachers and university lecturers could raise their awareness of basic employment needs, and negative features of work in marine industries, without losing their 'love of the sea'. 49% of marine students in this sample have family or friends in the industry, but if quality is to be raised, more entrants from other backgrounds must be attracted, many of whom are reliant on negative stereotypes for information. Course reputation, and the physical environs of Plymouth were major reasons for choosing to study there, but better careers information is needed, along with measures to redress the negative stereotypes often associated with marine careers.

In order to attract high calibre students into marine studies courses, professional bodies must supply more industry specific careers information for schools, and marine industrialists might encourage more careers teachers to visit their premises. Once at university, ongoing work experience and careers education are essential in raising students' career maturity and commitment, in order to ensure future quality managers in the marine industry.

References

1. THE CHAMBER OF SHIPPING (May 1996) : *Statistical Brief, 4th quarter 1995*, (London, U.K.: The Chamber of Shipping), 10.
2. LOPEZ, J.E. and CORTES, T. (1993) Concerning Problematic of the Sub-Standard Container Ships: Proposal for Solution. *Proceedings of the VI-th Congress of the International Maritime Association of the Mediterranean* Volume 1, Bulgaria, 1993, pp.33-37.
3. H.M.S.O.(1990) *British Shipping: Challenges and Opportunities*. (London, U.K.: H.M.S.O.)
4. H.M.S.O. (May 1994) *Safer ships, cleaner seas. Report of Lord Donaldson's inquiry into the prevention of pollution from merchant shipping*. (London, U.K.: H.M.S.O.)
5. THE CHAMBER OF SHIPPING (May 1996), op. cit., 10.
6. SPRUYT, J. (1996) What should be done to prepare managers for their future in the shipping industry? *Maritime Excellence in London* Nautical Institute, London, June 1996. (London, U.K.: Spruyt & Co.)
7. TSAKOS, P.N. (1996) Shipping beyond 2000 - The views of an independent shipowner; Reginald Grout Memorial Lecture, 1 May 1996. In: *The Proceedings of the Chartered Institute of Transport*, 5(3), 3-14.
8. GALLUP, (1970), The attitude of seafarers to their employment. *The Committee of Inquiry into Shipping*, Social Surveys (Gallup Poll) Ltd. (London, U.K.: Board of Trade)
9. FRICKLE, P. H., (1974), *Social Structure of Crews of British Dry cargo Merchant Ships: A Study of the organisation and environment of an occupation*. (Cardiff, Wales: Department of Maritime Studies, University of Wales, Institute of Science and Technology).
10. HIBBS, J., (1988), *An Introduction to Transport Studies*. (London, U.K.: Kogan Page, 2nd ed.).
11. HOPE, R., (1980), *The Merchant Navy*, (London, U.K.: Stanford Maritime).
12. BOULTER, J. D., (1991), *Recruiting: marketing the merchant navy*, unpublished DMS project, (Plymouth, U.K.: Institute of Marine Studies, University of Plymouth).
13. ARNOLD, J., (1991), *Work Psychology: Understanding Human Behaviour in the Workplace*. (London, U.K.: Longman).
14. BLAU, G. J., (1985), The measurement and prediction of career commitment. *Journal of Occupational Psychology*, 58, 277-288.
15. DINWOODIE, J., (1996), The Decision to Study Transport at University. *Proceedings of the Chartered Institute of Transport*, 5(2), 46-54.
16. HIBBS, J., (1988), op. cit., 66.
17. ARNOLD, J., (1991), op. cit., 193.
18. KIDD, J.M., and KILLEEN, J., (1992), Are the effects of careers guidance worth having?: Changes in practice and outcomes. *Journal of Occupational and Organisational Psychology*, 65, 219-234.
19. MILLWARD, L.J., Focus Groups, Chapter 18 in BREAKWELL, G. M., HAMMOND, S., and FIFE-SCHAW, C., (1995), *Research Methods in Psychology*, Sage Publications, London, UK, 274-292.
20. MENDENHALL, W., REINMUTH, W., BEAVER, R., and DUHAN, D. Statistics for Management and Economics, (1986), Fifth Edition, Duxbury Press, Boston, USA.
21. DINWOODIE, J., (1994), *Careers in Transport: A case-study at the University of Plymouth*. Unpublished Master of Education (Higher Education) thesis, (Exmouth Campus, University of Plymouth, UK.).
22. ARNOLD, J., (1989), Career decidedness and psychological well-being: a two-cohort longitudinal study of undergraduate students and recent graduates. *Journal of Occupational Psychology*, 62, 163-176.
23. HIBBS, J., (1988), op. cit., 77.
24. KIDD, J.M., and KILLEEN, J., (1992), op. cit., 226.
25. BOREHAM, N. C., and ARTHUR, A., (1993), *Information Requirements in Occupational Decision Making*, Employment Department Group, School of Education Research Series, no.8., (University of Manchester, U.K.)
26. FRICKLE, P. H., (1974), op. cit., Table 4.3, 132.

Also see:

Dinwoodie, J. (2000b, Work 4, *op. cit.*), Ch.4, 51-62.

Qualitative Analysis of the Study Decision.

and

Dinwoodie, J. (2000b, Work 4, *op. cit.*), Ch.6, 97-127.

Mapping and Comparing Postgraduates' Study Decisions.

Section C.

**An assessment of some methods available
for analysing student perceptions.**

Paper 6

THE DECISION TO STUDY INTERNATIONAL SHIPPING AT POSTGRADUATE LEVEL: HOW FAR DOES THE EVIDENCE SUPPORT RECENT SOCIO-COGNITIVE THEORIES OF CAREER DEVELOPMENT ?

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ABSTRACT

A highly educated workforce of senior managers in International Shipping is essential if the industry is to maintain its quality standards and competitive edge in a complex global economy. In ensuring an ongoing supply of highly qualified senior managers, human resources managers need to understand what motivates talented staff to seek to undertake postgraduate courses. The work reported here aimed to evaluate the usefulness of Lent et al's [1] attempts to create a unified social cognitive theory of career and academic interest, choice and performance in generating new insights into our understanding of why aspiring shipping managers seek to undertake vocational

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postgraduate study. Propositions relating to how the individual manages issues of self efficacy, expected outcomes from decisions and their personal goals can be linked with other personal factors, the contexts within which decisions are taken, and their previous experiences. These propositions generated useful hypotheses which were tested against empirical work with vocational Masters Level students at the University of Plymouth relating to how and why they decided to enrol on their courses. There was insufficient evidence to test the overall veracity of unified socio-cognitive theories of personal development in the shipping industry, but it did support some propositions and has implications for ensuring the ongoing quality of managers in shipping.

KEYWORDS

Postgraduate study decisions, international shipping, theories of career development.

INTRODUCTION

International Shipping requires highly educated senior managers if it is to maintain its competitive edge. Thomas [2] noted the need for a manpower development plan in the successful management of port operations in developing countries, which must include a statement on the required qualifications of new entrants, but human resources managers need to understand what motivates talented staff to gain postgraduate qualifications. Lent et al's [1] unified social cognitive theory of career and academic interest, choice and performance proposed twelve predictions, each including several hypotheses, and some of those relating to academic interests which could be tested against existing data relating to the perceptions of students enrolled on postgraduate courses at Plymouth (mainly 1,3,5,10) are discussed. Following a

brief literature review, the study methodology and empirical results are presented before concluding.

LITERATURE REVIEW

Empirical work relating to the undergraduate decision to study transport at Plymouth [3] revealed the role of relatives and childhood experiences as being important in forming an initial latent interest, influencing a personal and often pragmatic decision to study in later life, later followed by justification of, and pride in making the decision. Marine studies undergraduates [4] highlighted 'love of the sea' as their major reason for choosing the subject, but with more interest in employment issues towards graduation. Course quality and the physical environs of Plymouth were attractions, and 50% of respondents had family or friends in the industry. In the broader context of international students, Harris [5] noted the need to view the whole study process as a life-cycle approach to each individual overseas student experience, from selecting a university to returning home.

By combining concepts from educational and careers based literatures, within a triadic reciprocal causality, in which overt actions, in the form of the behaviour of the individual, were seen to interactively influence the person-environment relationship, Lent et al [1] adopted a dynamic view of self. Self-efficacy, relating to an individual's judgement of their ability to attain certain outcomes was viewed as dynamic, implying ongoing reappraisal of their perceived capabilities in the light of past performances. Outcome expectations, which would result from taking actions with particular perceived monetary, approval or self-satisfaction effects, interact with self-efficacy. Finally, the goals of postgraduates, expected to be tempered by reflections on self-efficacy and expectations, might also consider the realism of employment

conditions. In Lent et al's model, vocational and academic interest is predicted to depend on self-efficacy (link 1) and outcome expectations (link 2), in turn influenced by self-efficacy (link 7), with both dependent on learning experiences, in turn influenced by personal factors and background. Vocational and academic choice goals will depend on interest (link 3), outcome expectations (link 8) and self-efficacy (link 10), and choice actions will depend on choice goals (link 4), outcome expectations (link 9) and self-efficacy (link 11). Performance domains will depend on choice actions (link 5) and self-efficacy (link 12) and in turn loop back to influence learning experiences (link 6). Contextual influences proximal to choice behaviour, influenced by person inputs, will in turn impact on choice goals and actions.

METHODOLOGY AND SURVEYS

Analysis of 8 focus groups of students in 1996 each considering the instruction "Please think of yourself in relation to Masters Level study in Shipping at Plymouth" generated 9 major issues of concern (statements 5,11,19,27, 36,45,65,75 & 82 in Table I), each including several items within it. These were developed into a verbatim instrument presented to 21 Masters students at Plymouth in 1997, and 24 students in January and March of 1998. The tick-box format included 96 statements, each of which were rated by respondents as irrelevant, relevant, important or critical to their perceptions of their decision to embark on their course of study. Sampled groups included all members enrolled in their particular cohorts and although predominantly male, under 30, and varying from year to year they were multi-national, with many recording several years of work experience, which was mainly sea-going for one third of them.

RESULTS

At a descriptive level and quite unsurprisingly, almost all students recorded firm reasons for wanting to study at postgraduate level in shipping, in the UK, at Plymouth,

TABLE 1. The perceived importance of issues in deciding to study at Masters level.

Statement number: How important were:	Relevant		Critical
	1997	1998	1998
(Data refer to the percentage of students).			
5: family or friends in influencing your decision?	81	70	13
11: reasons which made studying Shipping at postgraduate level attractive ?	100	87	48
19: reasons which might have put you off studying shipping at postgraduate level	71	70	26
27: sources of information about courses ?	100	96	18
36: reasons which made studying shipping in the UK attractive ?	95	96	26
45: reasons which made studying shipping at Plymouth attractive?	100	96	9
65: reasons which might have put you off studying shipping at Plymouth ?	71	69	26
75: reasons for not studying elsewhere ?	67	83	21
82: barriers which might have put you off studying shipping at Plymouth ?	81	78	4
83: money factors ?	43	65	13
88: the quality of life in the city, accommodation etc.?	57	65	9
89: teaching methods ?	86	91	26
15: I studied shipping .. to broaden my career opportunities / be sure to find a job.	76	83	39
16: I studied shipping at postgraduate level to specialise in shipping, as I want to work there.	81	91	48
40: I studied shipping in the UK... the language of shipping, to gain more opportunities	71	61	31
50: I studied at Plymouth because it specialises in shipping.	81	91	26

31: I found out about courses by reading magazines / books/ brochures.	48	52	9
33: I talked to others planning to study there.	10	30	4
34: I talked to students / former students on the course.	48	56	22
73: I would not have studied at Plymouth if students had given me bad reports about it.	62	52	4

TABLE II. Selected correlations between self-efficacy beliefs and other issues.

Key to statements: Spearman rho correlations: *(**) significant at the .95 (.99)% level.

54: Studying shipping at Plymouth was attractive because I had already studied there.

57: Studying shipping at Plymouth was attractive because they accepted me.

15: I studied shipping to broaden my opportunities / be sure to find a job.

16: I studied at postgraduate level to specialise in shipping, as I want to work there.

40: I studied shipping in the UK..the language of shipping. to gain more opportunities.

47: I studied at Plymouth: its reputation is important when looking for a job.

71: I might have been put off if Plymouth considered my grades to be inadequate.

86: My company or parents partly funded and encouraged me.

102: Number of years of work experience.

7: My family / friends introduced me to the industry.

28: I found out about courses by talking to a work friend / people in industry.

53: Studying shipping at Plymouth was attractive because I have friends who have completed the course.

8: Talking to my family and friends influenced my decision to study.

29: I found out about courses because my previous lecturers told me about them.

33: I found out about courses by talking to others planning to study there.

34: I found out about courses by talking to students on the course.

Statement	1997	1998a	1998b	1997	1998a	1998b
Correlation	S54	S54	S54	S57	S57	S57
S15	0.21	-0.07	0.15	0.37	-0.08	0.13
S16	0.10	0.00	-0.05	0.22	-0.24	0.34
S40	0.10	0.22	0.25	0.44*	0.16	0.41*
S47	0.04	0.15	0.26	0.19	-0.21	0.05

Correlation	S54	S54	S54	S57	S57	S57
S102	-0.10	-0.08	-0.07	-0.13	-0.11	-0.18
S7	0.05	-0.15	-0.17	0.03	0.19	-0.13
S28	-0.26	-0.16	0.08	-0.37	-0.00	-0.05
S53	0.14	0.33	0.37	0.13	-0.32	-0.04
S8	0.22	-0.04	0.05	0.37	-0.03	0.24
S29	-0.09	0.69**	0.42*	-0.05	-0.27	0.14
S33	0.12	-0.05	0.02	0.15	-0.17	0.09
S34	-0.13	-0.00	-0.04	-0.25	-0.27	-0.07

and sources of course information as the main broad issues relevant to their study decision (Table I). Family and friends and barriers were also usually relevant, but about 30% recorded no reasons which might have put them off either postgraduate study, or study at Plymouth. With regard to more detailed items within issues, the desire to study shipping particularly for employment reasons was perceived as relevant to over 70% of students, and critical in about 30% of decisions, but money factors, living conditions and the comments of other people were less important.

Although many of Lent et al's concepts were alluded to in the Plymouth focus groups, the role of self-efficacy was weaker than expected. Like other issues, it was raised (e.g. S54,57,71,86 in Table II), but correspondence between theoretical hypotheses and empirical statements was often oblique. Interest (S11), choice actions (S75) and entry behaviours (S27) featured, but where outcome expectations (S16, 40, 47) and vocational interest (S15,16,40,47) were sometimes combined in the same statement, this heightens interest in their interactions. In that all respondents had signalled their vocational interest by enrolling on the course, the proportions to whom outcome expectations were important were used to test hypothesis 1B, predicting "a positive relation between occupationally relevant positive outcome expectations and vocational interests". Where these issues were "important" to over 42% of students,

“critical” to 30%, and study as a postgraduate specialism (S16) was “relevant” to over 80% , this evidence supports hypothesis 1B. Proposition 5, relating to people aspiring to enter occupations or academic fields consistent with their primary interest areas, generating a hypothesised positive relation between indices of interest and choice goals, was upheld where statements expressing a desire to study and work in shipping (S16,50 in Table I) were “relevant” to 80% of students, and “important” to 60-70%.

Hypothesis 1A postulated a “positive relation between occupationally relevant self-efficacy beliefs and vocational interests”, but few of the correlations relating self-efficacy (S54,57 in Table II) to vocational interest (S15,16,40,47) were statistically significant. There was a weak link between students to whom prior study at Plymouth was important (S54), and those seeking to practise the language of shipping to gain more opportunities (S40), but the only significant link was between those who were attracted to Plymouth because it had accepted them (S57) and S40. Changes in correlations between January and March 1998 data on items linked with S57 suggest that the perceived importance of the fact that Plymouth had accepted students became more positively associated with vocational interests, the longer they had spent there.

Table II also shows correlations between statements used to test hypothesis 3B that “occupationally relevant self-efficacy will be related positively to entry behaviours (e.g. information and job searches, applications for admission / employment, declarations of an academic major, attained choices)”. In this study measures of occupational self-efficacy were related to prior study (S54) or course acceptance (S57), while a range of oral (S33, S34) or other literature sources or search behaviour in general (not shown here) were proposed as evidence of entry behaviour. No

statistically significant correlations were found here or in testing hypothesis 10A, that "self-efficacy beliefs regarding particular career/ academic activities will be positively related to the perceived amount of a) personal success experiences b) exposure to successful models c) favourable social persuasory communications...". Measures of self-efficacy beliefs (S54,57), were linked with work experience variables (e.g.S102) representing personal success experiences, talking to family or friends in the industry or who had completed the course (S7,28 & 53), representing exposure to successful models and talking to others about the study decision (S8,29,33 & 34), representing favourable social persuasory communications. None of the measures identified supported the linking of self-efficacy beliefs to the defined measures of personal success experiences, and a weak link between those who had already studied on the course and those who had friends who had completed it was insufficient to uphold the relation with exposure to successful role models. The only significant associations were between those studying at Plymouth because they had already done so, and those who found out about their courses because their previous lecturers had told them about it, suggesting some link between favourable social persuasory communications and self-efficacy beliefs. Multiple regression techniques were used to test other higher order hypotheses, such as 1C which predicted that "an additive combination of self-efficacy and positive outcome expectations will account for more variance in career / academic interests than will either self-efficacy or outcome beliefs alone." In general, although some positive evidence was found to support this and similar hypotheses, it was inconclusive. Lack of data prevented examination of hypotheses involving academic performance, and its links with choice goals and actions (hypotheses 8 and 9).

CONCLUSIONS.

Lent et al's work generated new hypotheses, with relations such as those between positive outcome expectations and vocational interest (1B), and interest and choice goals (5A) being upheld. However, the oblique link between theoretical hypotheses which were not uniquely represented by particular verbatim statements from the Plymouth database, reduced measures of correlation between them. Examples included hypothesised links between self-efficacy beliefs and vocational interest (1A), entry behaviours (3B) and success experiences (10A). Formal testing of these propositions will involve bespoke studies, testing a broader range of concepts, with more emphasis on measures of academic performance and self-efficacy. Theoretical extensions of the model, initially aimed at early career choices, may be needed to include students seeking career change, and systematic analysis of individual differences may be required to validate any contextual influences involved. If the approach is validated, it implies a need for greater industry-wide involvement in exposing more young people to shipping at an early age to develop interest in aspiring managers, with ongoing careers guidance to nurture it, and feeding performance information back into the cycle of learning experiences, self-efficacy and outcome expectations.

BIBLIOGRAPHY

- [1]. Lent, R.W., Brown, S.D. and Hackett, G. (1994). Towards a unifying social cognitive theory of career and academic interest, choice and performance. *Journal of Vocational Behaviour*, 45, pp.79-122.
- [2]. Thomas, B.J.(1995). Manpower and employment issues. *Maritime Policy and Management*, 22.(3), pp. 239-253
- [3] Dinwoodie, J. (1996) The decision to study transport at university. *Proceedings of the Chartered Institute of Transport* (London), 5.2, pp.46-54
- [4] Dinwoodie, J., and Heijveld, H.(1997) Ensuring quality managers in the marine industry: an analysis of the undergraduate decision to embark on marine studies courses. In Sag, O.K., (ed.), *Proceedings of the Eighth Congress of the International Maritime Association of the Mediterranean. Volume 3, Istanbul, Turkey, November 1997*. (Istanbul Technical University Maritime Faculty, Istanbul, Turkey). pp. 13.1.1 - 13.1.10.
- [5] Harris, R., (1995) Overseas Students in the United Kingdom University System. *Higher Education*, 29, pp. 77-92.

Paper 7

The Pedagogic Value of a Computer-Based Instrument Investigating why Students Embarked on Postgraduate Business Courses.

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Introduction.

In an era of life-long learning, academics need to understand why postgraduate students choose to enrol on particular courses, in order to plan both their provision and marketing. At another level, postgraduate business students require real and immediate problem contexts within which to evaluate advanced business techniques and methodologies. The paper describes the challenge of developing a computer based instrument (CBI) to address these needs involving students in using learning technology (LT) to explore how they decided to study international shipping and logistics (ISL). Its application to large groups and pedagogic worth are also assessed.

Inevitably, developing a CBI focused on careers issues, drew on a wider careers and LT literature. Issues relating to how LT can link both technical and theoretical elements of vocational disciplines, along with ways in which initial positive attitudes to LT can be maintained were encountered. In turn, these inter-linked with issues of graduate recruitment and the need for careers education on courses.

Stoner's (1997) model for evaluating the implementation of LT into courses provided a useful checklist and framework within which to address problems encountered while developing the CBI. In the model, teaching was presented as a mediated learning process, within which dialogue is paramount, with LT integration viewed as a systems life cycle. In the implementation process, issues of pedagogy, student motivation, resources and technology were raised. Finally, some observations on how LT might enhance student learning aided the evaluation process.

The CBI is described further along with examples of the empirical analysis of findings in the survey relating to how information technology (IT) resources and teaching styles influenced the decision to undertake postgraduate study. Pedagogically, the instrument improved data collection and handling processes, helped students to personalise a reflective process efficiently in a large group, and integrated their perceptions of the role of IT skills within broader course contexts.

Stoner's (1997) model enhanced the evaluation of this approach, and other universities would benefit from developing and using similar instruments to that reported in this paper.

Learning technology, careers education and graduate recruitment

In developing the CBI, pertinent literature included the role of LT in linking technical and theoretical elements of vocational disciplines, and ways in which initial positive student attitudes to LT can be maintained. Issues of graduate recruitment and the ongoing role of careers education were also encountered.

If the perceived profile of LT in the pedagogic process is to rise, it must become linked with core processes in higher education, including careers education, where students might associate it with graduate recruitment. Patel *et al* (1998) explored how the technical elements of a vocational discipline could be reconciled with more academic perspectives, finding that computer integrated learning environments involving practical skills acquisition could reinforce pedagogic emphasis on theoretical issues in the accounting profession. Increasingly, professional accounting skills are developed in a computer based learning environment affording independent learning, which is interactive and yet responsive to individual needs, participative and yet developmental. The challenge in ISL is to integrate technical skills acquisition with deeper theoretical issues, while remaining relevant to the individual's personal development needs. Careers issues could provide this link.

Once acquired, computer based skills offer accounting students many benefits, which may enhance their general employability (Marriott, 1997), in turn influencing their course choices and career aspirations. However, concerns that acquiring such skills on introductory undergraduate courses may tarnish attitudes towards computers, possibly reinforced at higher levels, were unfounded except where computers were used

solely as computational devices. This implies integration of their use within core course contents where possible, maintaining positive attitudes towards them until competence, and consequent positive feelings, are established.

A careers related CBI, could be viewed within the contexts of graduate recruitment and careers education. In the graduate recruitment process for accountants, personality or social traits have emerged as significant employee attributes (Ahadiat and Smith, 1994), and an applicant's ability to follow often implicit rules of conduct, affect recruitment. Ideally, a CBI will assist students in acquiring these traits. Disturbingly, the views of academics have been perceived by students as the most important source of information about the workplace (DeZoort *et al*, 1997), but significant differences in its perception have been found between academics and students. Although academics may need better information regarding workplace developments, CBIs might represent one application of LT, which could monitor student perceptions of these issues efficiently.

Careers education has long addressed issues of professionalism in vocational business courses, imparting vocational knowledge in participants, aiding job search processes, and fostering interpersonal skills (Sergenian and Pant, 1998). A careers related CBI could assist this process of shaping individuals from diverse background into rounded professionals with some commonality of outlook and attitude towards their occupational identity.

Applying Stoner's model for implementing Learning Technologies.

Stoner (1997) outlined a model for the implementation of LT, in turn based on Laurillard's (1993) work. This provided both a useful checklist and a framework for addressing problem areas in the current study. In the model, teaching was presented as a mediated learning process, within which dialogue is paramount.

Teaching should, inter alia, address experience of or in the 'real world', and encourage and support students' reflection upon their and others experience of the world; enabling students to contextualise their conceptual understanding of knowledge. (Stoner, 1997, pp. 41-42).

Later in the model, LT integration was viewed as a systems life cycle, ahead of the implementation process, which included issues of pedagogy, student motivation, resources and technology. Finally, observations on how LT might enhance student learning were presented.

In this study, although not every detail of Stoner's approach was used, it did provide useful guidance in conceiving a model of this particular learning process, in tackling implementation issues, and a set of observations with which to evaluate the process.

How was the approach developed?

The substantive course for which the instrument was devised aimed to -

- develop an awareness of business systems methodologies appropriate to the analysis of complex shipping and logistical business systems

incorporating an objective to -

- enhance the ability of the student to structure complex problems in shipping and logistics.

The course context within which the instrument was devised (Table 1) demanded both a formative and summative context within which to motivate 50+ Masters level students.

The instrument which students completed was pre-structured, but the evaluative process demanded that each participant enter into a conversational mode, by being required to select the issues, and items within issues, which shaped and defined their own decision environment. Within this conversational framework, the exercise proved to be:

- discursive, in that each individual explicated their personal decision agenda;
- adaptive, in that no two choice sets of significant issues and items were identical;
- interactive, where each response successively redefined perceptions of the exercise;

- reflective, in that the problem context was phenomenologically based, requesting students to recount the experiences of themselves and peers who had influenced them, within the context of the process which had placed them on their current courses.

The systems life cycle view of LT integration (Stoner, 1997, p.43) commences by defining initiation processes, recognising in this case, the dual needs of both providing information for course planners, and developing pedagogic devices with which to assist the learning of students. It proceeds by analysing and evaluating the situation (Table 1) and identifying potential courses of action, which here included a CBI. The twin steps of selecting an appropriate LT and design integration were relatively straight-forward in this case, but the implementation issues (Table 2) are more fully reported. The processes of monitoring and adapting the integration, and later evaluating it, (Table 3) are ongoing. Central to this iterative and recursive process, are issues of control and quality assurance, and considerations of student motivation.

Characteristic.	Description
Programmes of study	A combined group of students drawn from M.Sc. International Shipping M.Sc. International Logistics
Context of the application	10 hours contact in a "Business systems and operational research (OR)" module, exploring methodologies for investigating complex business systems, systems analysis, cognitive mapping and systems dynamics, OR case-studies and appropriate industrial applications of modelling business behaviour.
Class size	50+ students
Student background	Multinational. Diverse first degrees. Diverse industrial experience. Multilingual.
Prior knowledge	Completion of introductory IT and statistics courses.
Co-requisite studies	Options including Finance and International Monetary Economics, International Logistics Policy, and International Physical Distribution.
Contact time	One lecture; designed for personal student reflection and self-completion later. Applied in January, following prior study in Plymouth, the Netherlands or, exceptionally, exemptions afforded by distinction in preparatory diploma courses.
Assessment regime	One of 5 bi-weekly continuously assessed course-works, and optionally, an examination question.
Origins of the instrument	Focus group interviews, and prior testing of a 'paper' based instrument.
Future role of the instrument	Will be repeated, although items selected may eventually vary; invites similar applications at other universities.

Table 1. The context within which the instrument was developed.

Implementation issues (after Stoner, 1997, pp.44-7)

Pedagogical issues:

did the exercise create a more complete learning dialogue?

Asynchronous reflection by students was possible, where email empowered them to choose when to contact the lecturer. Similarly, they were not bullied into immediate convenient responses, but given time to reflect

A remote instrument enabled personal prompting and response without the need for repetitive staff interviews

Email encouraged a two-way dialogue, not possible otherwise

Student motivation.

- "It's my career". Through owning the issue, students were motivated.
- The approach was necessarily supportive rather than supplantive, given teaching elsewhere on the course (Table 1).
- The exercise was coursework based, but fed into topics, examined later
- Where students displayed low self-efficacy towards using IT, the exercise presented an immediate, but relatively non-threatening environment
-

Staff and resources

- Having evolved locally, the instrument 'invented here', was accepted
- Although relatively low-tech, this approach was appropriate for this multinational group
- Student peer support supplemented limited staff resources
- The potential reward of research output from data collected motivated staff
-

Technical issues

- A relatively low-tech approach enabled students to concentrate on the issues, rather than the technology involved.

Table 2. Implementation issues

Table 3, based on a checklist of observations generated by the approach, summarises actions taken explicitly in implementing the CBI, using Stoner's (1997) methodology.

Observation for implementing LT (Stoner 1997, pp.49-50)	Action
Cost reduction must not be the prime concern	Reasons for this action: 1. To assist students to clarify their own motives for joining this course. 2. To ensure a basic minimum level of IT competence before proceeding with other studies. 3. To generate data for specialist analysis later.
How LT is integrated into the course is more important than the quality of the LT materials	This approach aimed to: 1. 'Ease back' returning students into the local technical environment, or provide introductory experiences for unfamiliar users. 2. Provide a practical introduction to subsequent lectures in cognitive mapping techniques.
Use LT to support the learning dialogue	Individual interviews with 50 students were heuristically infeasible; employing LT bridged this gap.
Introducing LT will change the whole course	LT reduced paperwork and data processing costs. Time was released for discussions with students, important where personal contact is a hallmark of their educational experience.
Continuously evaluate the effects of LT integration	LT is one learning medium used on the course. Problems with the particular email system restrict its scope.
Motivate students to use LT	Electronic submission of coursework relating to their own career decisions, confronted participants with an experience in which LT was integral to their personal development.
Motivate staff	Development time of this instrument was high, but electronic submission reduced marking time. A research database generated presented an added incentive.
Do it!	Success with this instrument opens the door to other applications of LT.

Table 3. Actions taken in implementing this case-study based on Stoner's (1997) observations.

An instrument to analyse the decision to study ISL.

At Plymouth, Diplomas in Professional Studies (DPS) in Shipping and Logistics Management afford combined study of both disciplines within a European or world-wide context, only specialising at Masters level into International Shipping or International Logistics. Given this context, the findings reported pertain to one institution, inviting further investigation into their replication elsewhere.

There is some documentation of the processes by which undergraduates decide to study transport (Dinwoodie, 1996), or more generally (Dearing, 1997), but negligible analysis of postgraduate decisions to study ISL. Accordingly, initial research used focus group interviews, which enabled students to express their concerns verbatim; these concerns were later analysed using quantitative content analysis and honed into a tick-box format instrument. Computer based technologies (CBT) may assist in the management, retrieval and coding of qualitative texts, and in developing and testing hypotheses (Catterall and Ibbotson 1997), but the benefits are cumulative, dependant on the scale of projects and the repetitiveness of analytical procedures. CBT proved inappropriate for analysing the one-off datasets collected from eight focus groups. Following piloting, the instrument was administered and repeated with students who were requested to submit their coded responses electronically, using email or discs.

In analysing the individual decisions of postgraduate students from multifarious academic disciplines, nationalities and industrial experiences, sharing a common decision to study at one university, causal cognitive maps enabled some quantitative analysis of the differences between them (Langfield-Smith and Wirth, 1992). This analysis, not reported here, added impetus to the exercise, but also required a paper-based mapping exercise.

Overall, nine major issues of interest emerged, each consisting of a number of items within it. Students were requested to consider the following issues and items within them, and then rate the importance of each in their overall study decision. Issues related to:

- How did your family or friends influence your decision to study?
- What reasons made studying Logistics / Shipping at postgraduate or post-experience level attractive?
- What reasons might have put you off studying Logistics / Shipping at postgraduate or post - experience level?
- How did you find out about courses in these areas? How important was each source?
- What reasons made studying Logistics / Shipping in the UK attractive?
- What reasons made studying Logistics / Shipping at your university attractive?
- What reasons might have put you off studying Logistics / Shipping at your university?
- Think of courses which you could have studied elsewhere. Why did you not study *elsewhere*?
- How important are particular barriers which might have put you off studying Logistics / Shipping at a particular university? These related to money, quality of life in the city and teaching methods.

Principal component analysis was employed to identify the major dimensions of statistical divergence in the data pertaining to each of the items associated with these nine issues. All factors with eigenvalues exceeding unity were included, and their individual contribution to the percentage of total variation is shown, but as with any exploratory factor analysis, a unique interpretation of factors is not guaranteed.

The role of IT resources and teaching in this decision to study

An example of the factor analysis conducted on the data generated by the instrument described above related to the reasons which made postgraduate study of ISL attractive. Details of items relating to this issue are discussed, before points relating to other issues are summarised. These data represent two cohorts of combined groups of international Masters level students (Table 4), and diploma students (Table 5) drawn mainly from European or wider international backgrounds.

85 Masters level students. 44 shipping, 41 logistics.	Factor 1	Factor 2	Factor 3
I wanted:	loading	loading	loading
to broaden my knowledge / learn new things	0.236	-0.123	0.916
to enact my long term career plans	0.657	0.003	0.153
a change of career / to go ashore	0.649	0.457	-0.274
to broaden my opportunities / be sure to find a job	0.695	-0.316	-0.192
to specialise in shipping as I wanted to work there	0.537	-0.254	-0.044
more study, following my work experience	0.098	0.889	0.187
Percentage of variance explained by factor:	28.2 %	19.7 %	16.9 %.

Table 4. Principal components analysis of reasons which made studying ISL at Masters level attractive.

52 postgraduate level diploma students.	Factor 1	Factor 2	Factor 3
I wanted:	loading	loading	loading
to broaden my knowledge / learn new things	0.507	0.441	-0.607
to enact my long term career plans	0.618	-0.299	-0.145
a change of career / to go ashore	0.535	-0.455	0.544
to broaden my opportunities / be sure to find a job	0.583	0.418	0.259
to specialise in shipping as I wanted to work there	0.248	0.652	0.430
more study, following my work experience	0.602	-0.334	-0.251
Percentage of variance explained by factor:	28.1 %	20.0 %	16.7 %.

Table 5. Principal components analysis of reasons which made studying ISL at postgraduate diploma level attractive.

At Masters level, the reasons for undertaking postgraduate study included a "career change" factor loading positively on items relating to enacting long term career plans, career change, and broadening opportunities. This was understandable in a group drawn from a range of undergraduate disciplines and with varying levels of industrial experience. A second factor, related to a desire to return to study following work experience, may have applied more to students with extensive work experience. A third, related to a desire to acquire new

knowledge, may have applied equally to new graduates seeking to specialise, or experienced staff seeking new challenges. IT skills surely constitute such "new knowledge", and once acquired, can "broaden opportunities".

At diploma level, the first factor identified was similar, with a search for "new opportunities" being important in the decision, loading positively on a desire to enact long term career plans, return to study following work experience, and broaden opportunities. A second factor related to a desire to specialise and work in shipping, not present in the Masters level groups, was probably strongest in the relatively young and inexperienced group of European students. The third factor, defining a desire to change career and go ashore, and loaded negatively on a desire to broaden knowledge and learn new things, probably represented desires in the industrially experienced group of seafarers to change career direction.

Similar analyses, for all nine issues, and varying combinations of subject area interest in ISL, were made possible by the efficient data collection procedures resulting from using the CBI, which released more resources for analysing the data. Some findings directly pertinent to the perceived role of IT and LT on student decisions to undertake postgraduate study are noteworthy.

- An element of caution defined the main factor statistically influencing why diploma (but not Masters) level students might have been deterred from undertaking postgraduate study. This included high positive loadings on the item relating to fears of returning to study, implying low self efficacy, known to be associated with limited confidence in using IT generally, in the earlier focus groups.
- An academic system "relevant to industry" influenced the decision to study in the UK. Although secondary to a "utilitarian" factor for Masters level students, this factor loaded highly on the international recognition afforded to qualifications, and the non-availability of suitable courses in other countries. For diploma level students, the industrial relevance and utilitarian factors combined, loading highly on items such as the recognition afforded to qualifications, and the importance of the UK's shipping tradition. Perceptions of IT provision surely influence both course relevance, and the status of qualifications.
- A factor relating to how "reasonable" a university was perceived to be summarised the importance of reasons which might have deterred students from studying there. This factor loaded highly on resource ratings, and recognition of awards by employers, but IT facilities and training issues had been raised in this context in the preliminary focus group studies.
- The main pedagogic barrier which might have deterred both diploma and Masters level students from studying at their university, involved a factor loading positively on all items, but most highly on a "need to understand, rather than merely to analyse statistics". In short, perceptions of an unsympathetic approach to IT and LT may deter applicants.

The pedagogic value of the instrument

- Stoner's (1997) methodology for the implementation of LT provided a useful tool with which to reflect on, evaluate and modify this particular application.
- The CBI drew each student into a conversational dialogue in which they selected the issues, and items within issues, which had shaped and defined their own postgraduate study decision environment.
- Students were motivated by an instrument drawing on their own experience, providing them with a personal platform from which they could later build and evaluate applications of business techniques and methodologies.
- Stoner's (1997) checklist of observations for implementing LT provided a useful framework for evaluating the implementation. By subjugating the status of cost reduction concerns and concentrating on seeking to enhance student learning experiences, this instrument also enabled resource efficient personal contact with 50 students, and assurance of a minimum level of IT competence.
- The instrument generated useful research data, revealing how the ways in which IT and LT are presented and integrated into courses may influence the decision of students to enrol on them. Savings in teaching time attributable to the instrument also released staff resources with which to analyse data. It was found

that IT teaching and resources could increase the perceived relevance or status of particular courses, and address student feelings of low self-efficacy or an unsympathetic approach to pedagogy, which may form barriers and deter them from enrolling.

- By way of caution in research terms, inquerulous application of the instrument could promote oversimplification of complex personal choice processes, and replies based on reminiscence data, may reflect imperfect memory recall processes. Also, the use of IT in this context could over-legitimise an ephemeral snapshot perception of an ongoing decision process.
- If modified to meet local requirements, similar instruments incorporated into courses elsewhere could succeed in raising both student motivation, and increase understanding of why students are attracted to particular postgraduate courses, in an era of lifelong learning.

References:

- Ahadiat, N. and Smith, K.J. (1994) "A factor analytic investigation of employee selection factors of significance to recruiters of entry-level accountants" *Issues in Accounting Education*, Vol.9, No.1, Spring 1994, pp. 59-79.
- Catterall, M. and Ibbotson, P. (1997) "CAQDAS programs and qualitative data analysis: an introduction". *Account*, Vol. 9, No. 3. Autumn 1997. pp. 17-22.
- Dearing, R. (1997), "Full and part-time students in higher education: their experiences and expectations. Report 2". *Higher Education in the Learning Society*, National Committee of Education into Higher Education. (HMSO, London).
- DeZoort, F.T., Lord, A.T. and Cargile, B.R. (1997), "A comparison of accounting professors' and students' perceptions of the public accounting work environment". *Issues in Accounting Education*, Vol.12, No.2, Fall 1997, pp.281-298.
- Dinwoodie, J. (1996) "The decision to study transport at university". *Proceedings of the Chartered Institute of Transport*. Vol.5, no.2, 1996, pp.46-54.
- Langfield-Smith, K. and Wirth, A., (1992) "Measuring differences between cognitive maps". *Journal of the Operational Research Society*. Vol. 43 No.12, pp.1135-1150.
- Laurillard, D. (1993) *Rethinking University Teaching*, Routledge, London.
- Marriot, N. (1997) "A longitudinal study of student attitude towards and ability to use computers in higher education", in Fletcher, K., and Nicholson, A.H.S. (eds), *Selected Proceedings from the 8th Annual CTI-Accounting, Finance and Management Conference*, Newport, April 1997. pp. 74-83. CTI Accounting, Finance and Management at University of East Anglia
- Patel, A., Kinshuk, Russell, D. (1998). "Accounting education and computer based learning". *Account*, Vol. 10, No. 1, Summer 1998, pp. 21-26.
- Sergenian, G.K. and Pant, L.W. (1998). "Increasing students' professionalism: a careers project for accounting majors". *Issues in Accounting Education*, Vol. 13, No. 2. May 1998, 429-442.
- Stoner, G. (1997) Implementation issues: leaning towards learning in Fletcher, K., and Nicholson, A.H.S. (eds), *Selected Proceedings from the 8th Annual CTI-Accounting, Finance and Management Conference*, Newport, April 1997. pp. 40-51., CTI Accounting, Finance and Management at University of East Anglia, Norwich.

Also see:

Dinwoodie, J. (2000b, Work 4, *op. cit.*), Ch.10, 199-206.

Implications for Practitioners in Shipping and Logistics.

Section D.

**Outcome roles and other factors that
influenced student perceptions.**

See:

Dinwoodie, J. (2000b, Work 4, *op. cit.*), Ch.1, 1-12.

Human Resource Availability in Shipping and Logistics.

Also see:

Dinwoodie, J. (2000b, Work 4, *op. cit.*), Ch. 2, 13-28.

International Students, Universities and Recruitment.

Also see:

Dinwoodie, J. (2000b, Work 4, *op. cit.*), Ch.3, 29-50.

Evolving Perceptions of Employment Roles in Transport and Logistics.

Section E.

**Teaching aimed at raising perceptions of
professional skills requirements.**

Paper 8



THE ROLE OF A PEER-ASSESSED QUANTITATIVE CASE-STUDY IN DEVELOPING PROFESSIONAL SKILLS MORE EFFECTIVELY IN A MARITIME BUSINESS CLASSROOM

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ABSTRACT

Traditional courses in higher education for students of maritime business (MBU) have included introductory classes in operational research (OR), with teaching heavily reliant on lectures, and assessment limited to closed-book examination questions. This paper reports an attempt to assess an alternative approach, designed to address the need to develop a wider range of professional skills in such students. In particular, it asks whether a group role-based case-study report could be more effective than the traditional lecture and examination question. For all those involved, in both teaching and learning, the experience was a very positive one which if repeated at other educational institutions could enable a broader range of professional skills in maritime business classrooms to be developed more effectively, in turn raising the quality of the intake to the industry.

1. INTRODUCTION

The professional skills development needs of marine students may conflict with resource pressures imposed on lecturers by increased class sizes. Lecturers may become satisfied with the easy to mark assessments with pre-specified answers which converge on a single correct solution, which examination questions present. And yet, MBU students need to be

exposed to problem contexts with divergent outcomes which demand attempts to propose and explore possible solutions, with emphasis on the learning process where individuals work with others to manage uncertainty. Groupwork and case studies are required to develop and assess such skills. With this approach, students may specialise in particular topics and roles, both covering a wider range of topics, and encouraging knowledge to 'cascade' throughout their peer groups. Their responses can be recorded using diaries, regular minuted sessions and questionnaires

The paper begins with a brief review of some relevant literature on the need for groupwork, and how it may be implemented in the classroom. The particular class involved here was a Stage Two undergraduate group of 75 students, many of whom were facing their first exposure to the practical uses of OR in shipping business, but the approach presented could be applied to a range of MBU courses in Higher Education. It raises issues of the role and use of individual and peer assessment in case-studies, and self evaluation in quality control. The findings of the study are presented in relation to the attitudes of the MBU students involved, towards both OR and groupwork, before attempting to quantify the perceived value added by the assessment, and the reliability of the peer assessment which was conducted. The validity and usefulness of the findings is also discussed.

2. EDUCATION FOR COMPETENCIES

Groupwork can have many educational benefits for students, as well as making effective use of scarce educational resources. Its effects in this exercise are evaluated in terms of its impact on resources use and teaching methods, as measured by lecturer and student perceptions, and student education as revealed by written assessment and student self assessments. In Lawson's view [1], the only 'moderately effective' teaching resource for fostering higher level understanding skills of synthesis and judgement in Economics, a related subject, is via tutorials or groupwork. Projects are the only 'very effective' way of assessing them. Lower levels skills are easily taught and assessed via programmed learning, multiple choice, lectures, examinations and the like. 'To develop a student's synthetic and judgmental skills the best results are likely to follow from individual interaction with staff during project or dissertation work. Managers of complex human shipping systems need to develop purposefulness, being self-reflective and self-responsible humans [Marzen,2] where teamwork is an essential element. Infrequent groupworks on this particular MBU course, could make a group-based case-study a valuable experience for these students fostering the highest levels of cognitive skills. Also, it is an efficient means of developing such skills, being less resource intensive than individual projects.

What undergraduate competencies does the educational system value? White [3] attempted to build an inventory of competencies which educators valued on her campus, in an attempt to form a core curriculum. Staff were asked to rate 111 selected behaviours which were reduced via factor analysis to personal development, research activities, conscientiousness, self-confidence, student activities and community service, oral communication skills and questioning. Implicit in White's paper is a Technical Rational view of education: 'If the purpose of education is to produce changes in students...then only an evaluation of changes

in students can reveal how well those purposes are being served' [4]. She then placed such behaviours in a competencies framework of objectives which undergraduates should attain.

The teaching package being described aimed to encourage students to grow in personal development and self-confidence, both rated highly in White's study [3]. However, it was also designed to address industrially relevant competencies in group-process skills, critical thinking, problem solving and independent thinking. These aims are rated relatively low in White's study which used academics' ratings of skills, where research activities and community service predominate, but a ranking defined by industrialists may match more closely. Group process skills noted by White's students related to giving accurate feedback to colleagues, encouraging others to 'stay on task', encouraging participation, and sharing the 'speaking time' with others.

Case studies in teaching OR. The use of case studies in teaching OR in shipping is not new [Dinwoodie, 5]. At Plymouth, the OR element of taught postgraduate courses in shipping is typically assessed by case study following an introduction to basic techniques of OR and discussion of various systems methodologies. One of the cases devised at Plymouth, 'Cross channel shipping' (CCS) has been used both as an extended coursework and a day-long case-study examination. Comments from a workshop of OR teachers who attempted it, included: 'a realistic case....problem contexts did not easily fit particular OR techniques', 'a context requiring groupwork and use of computers' and 'a case which simulated 'soft' problems, involving questioning the true nature of the problem, not merely finding a single optimal solution.' CCS would encourage undergraduates to work together in small problem solving teams, but some practical issues are likely to be encountered.

Practical problems of groupwork. Gibbs [6] noted that group sizes of more than 6 are

'easy for lazy students to hide in', but peer assessment with distinct roles should reduce this effect. In addition, case studies can be used for assessment over prolonged periods, allowing deeper exploration of open-ended solutions and understanding of a systems approach requiring several people for several weeks. Predefined roles focus objectives and clear role definitions aid the process of exploring role conflicts, and employing systems methodologies enables analysis of alternative viewpoints to problems.

How should an individual's contribution to groupwork be assessed? Gibbs et.al. [7] outlined three ways in which individual contributions to a groupwork can be assessed. The simplest approach would award one mark to each group, but group work tends to be awarded higher marks than individual work, and individual weaknesses may be masked. Randomly formed groups with an even spread of ability may result in little spread of marks. Secondly, shared group grade allows individuals to distribute a given score among themselves, but some groups may agree an equal share to avoid unpleasantness. Alternatively, criteria may be negotiated or imposed by the teacher, but they must be clear and accepted at the outset. Finally, peer assessment (PA) of contribution to the group involves each member rating the contribution of each other in relation to each of a set of defined criteria.

Goldfinch [8] used a PA questionnaire, with a task share and a group functioning element. The first part asked each group member to state who contributed to each task, and the number of times an individual is mentioned influences their mark. The second part is based on each group member assessing the contribution of each other group member on aspects of the work. These included 'overall level of participation, suggesting ideas, understanding what was required, extracting something useful from the ideas, performing routine tasks, consolidating, keeping the group going' and 'sorting out problems'. Goldfinch reported marks similar to other elements of the course, but

hard working students, weak in mathematics, and mathematically able but inarticulate students both scored better than on individually written reports. Groups were apparently making good use of members skills. Some students reported difficulties in relating actual tasks undertaken to those highlighted, or disagreed with the weights given to each. The case for an element of PA is a strong one, but Goldfinch also noted that many students felt uncomfortable about making peer assessments.

How do students feel about peer assessment? Williams [9] described how students responded to like and dislike statements regarding peer and self assessment they had undertaken. He sought evidence of 'deep learning'. In the CCS assessment students are offered the option of either a single groupmark including some peer assessment, or assigning 50% of a student's mark to his role mark and 50% to the groupwork mark, placing the onus on each individual rather than the group to decide. This approach is both simple and includes some PA, and an element of student choice in assessment where students felt concerned by tasks given to them, demonstrating 'enterprising behaviour' including such competencies as negotiation skills, effective listening and open learning. Their work methods would include flexible learning and self evaluation, acquired in a learning environment less teacher-centred, with more student research and discussion and a less competitive atmosphere. 72% of students on a BA Business Studies course preferred lecturers in the facilitative role, and 64% preferred to negotiate their own assignments although 12% disliked such choice. 90% of students saw benefits in peer assessment, as it allowed them to compare their approaches, standards and exchange information. Alternatively they disliked criticising their friends or the arbitrariness of marking. Overall, 'peers tend to inflate friends' marks [but] the authors are realistic about the standard of their own work and mark appropriately when compared against a lecturer's judgement.' [Williams, 10] Students were willing to negotiate over how

they learn and are assessed, but only support the approach when guidelines are established first. Where teaching time permits Gibbs noted [11] that 'it is safer to start with peer assessment for the purpose of feedback'.

3. A METHODOLOGY FOR EVALUATING THE APPROACH

Self evaluation is potentially an important element in quality control, both for a lecturer evaluating teaching methods, and students evaluating their own output. Fish [12] discussed both 'technical rational' and 'professional artistry' models of quality assurance, which although intended for the appraisal debate in higher education, are equally pertinent here. In the technical rational model 'professional activity is a matter of technical performance ...[which] values... measurable skills, performance and procedures that can be mastered. ...The entire work of a professional consists of behaviour (performance) that is visible and observable and ...can..be monitored and measured. ...It demands proof of quality in terms of empirical evidence, and it emphasises quantitative data'. This contrasts with the PA model which 'sees teaching as a practical art. It stresses understanding rather than technical skills, and takes a holistic approach to skills and knowledge involved. ... The model stresses investigation and reflection on practice and its view of research is that of action research, that is, it sees the practitioner as continually investigating his/her own practice' [Fish, 13]. Elements of both approaches are relevant here. In terms of student competencies, a technical rational view might advocate that course content be industrially driven, as OR skills can have industrial benefits. An aim to develop an holistic understanding of the role of OR in business, and not merely present and test particular OR techniques is more akin to a professional artistry view, as is viewing teamwork skills as an integral part of a whole person. Where industry also considers this important, it could represent a technical rational perspective.

However, there is no attempt to assess or teach teamwork skills divorced from a wider conception of OR in business.

Evaluation of the approach. An action research paradigm underlaid the data collection methods employed, requiring students to keep diaries and reflect on their own experiences, (Tables 1 & 2) pointing them towards a reflective professional stance. Criteria for students to attain in their assessments (Table 3) recall the technical rationality model. In the process of triangulation to establish what is happening, views included those of groups, and reports from other staff on the module and course. After obtaining oral permissions to record comments when the project and teaching were being set up, several evaluation methods were used. These included student group reactions to teaching and problem solving in a group, keeping a diary of the lecturer's feelings and feedback from students, and recording any comments from students to the module and course leader.

Each person was asked to hand in a group report, with the 100% mark made up of for each of 5 roles, the lecturer's assessment of the work done by each role in relation to the criteria laid out (15%) and peer assessment of others' contribution to the group effort (5%). Students were asked to rate on a 5 point Likert scale from very poor to very good their satisfaction with each of the other roles in general, including class attendance, competence in the specialist function, providing key materials or information for the whole group, and general contribution to the task.

Limitations of the approach. Attempts were made to overcome or minimise potential problems but several criticisms of the approach were anticipated. Group sizes may have been too large, encouraging some 'hangers-on', but tight time and computing resources should reduce this effect with complaints of overwork more likely, thereby compelling students to work as a team. Insufficient time may have

Table 1. The student skills form.

What is your role ?
How would you rate your experience of the following topics ? Rate each item to show:
1: Very little 2: Some 3: Sufficient to use it.

Linear programming	1 2 3
Transportation problems	1 2 3
Trans-shipment problems	1 2 3
Depot location	1 2 3
Clarke Wright methods	1 2 3
Travelling salesman problems	1 2 3
The systems approach	1 2 3
Working in a group	1 2 3
Uses of OR in business	1 2 3
Understanding of teamwork	1 2 3
The role of computing solutions	1 2 3

Table 2. The role evaluation form

Please answer each item briefly.
Which role would you choose [did you choose], and why ?
What do you expect it to involve ?
Did it involve what you expected it to involve ?
How do you feel about the idea of working in a group ?
How do you feel about solving complex problems in a group ?
How do you feel about your mark depending partly on the work of others ?
NOTE: This questionnaire was given both before and after the assessment with only words shown in brackets differing.

elapsed to establish prior acceptance and familiarity with peer and self assessment procedures, and introduce material such as systems theory. Some students may be unhappy at not being able to undertake all roles, but specialists will need to guide others who may wish to get involved in the cascade process, and will be assessed by any dissatisfied colleagues. The work may be too close to exams, tempting some to attempt to avoid computing or

Table 3 The CCS case-study. Instructions.

You are required to:

1. Produce a group report which answers questions 1, 2a & 3.
2. Hand-in a full set of the agenda and minutes of meetings used in the 3 group sessions.
3. Produce a group report which summarises the feelings of all the group members about :
 - a) the teaching programme
 - b) what you have learned about problem solving in a group
 - c) any other comments about this part of the course: was it enjoyable, useful, interesting, demanding ? How do you feel about this method of presentation and assessment compared with the traditional closed book examination question ?

Duties of each role.

Computer specialists:

- attend specialist laboratory sessions and find out how to use software; produce printouts
- to run programmes for your group
- to ensure sufficient copies of output for the rest of your group to work with etc.

Systems thinkers:

- to collect additional handouts and attend specialist sessions
- to think through and read around 'systems in shipping' and disseminate findings in the rest of your group.
- to answer Q3.

Minute takers:

- to complete 3a under 'You are required to'
- ensure 3b is completed
- ensure agenda and minutes in 2 are completed

Question experts will need to:

- calculate costs of operations
- select and justify techniques of analysis
- comment on whether assumptions and methods are appropriate to the problem
- interpret and report on results and findings

mathematical work, but all students in this particular group have undertaken similar work elsewhere. Groups here were imposed, but abilities should be well diffused. Finally, if attendance and response rates to questionnaires are low, triangulation via multiple faceted data reference points should help to ensure the validity of the study, via peer assessment.

4: FINDINGS OF STUDENT SURVEYS

Student attitudes to OR, groupwork and peer assessment are discussed before noting some of the limitations of the study. Responses were analysed for the 'value added' for the 45 students who completed the skills form both before and after the assessment. They represent a direct comparison, and mirror closely the full-sets of 47 before and 64 after replies, which differ slightly as the assessment bridged exchange programmes for some students. 'After' results were analysed for actual roles of minute-taker, computing, systems thinker and question specialists, but 'before' skills ratings are by desired role, as 9 students would have preferred a different role to that allocated. This may explain some variation in answers.

Student attitudes to OR. Based on the frequencies of student responses to each category (1 = very little, 2 = some, 3 = sufficient to use a technique) of the student skills experience, the percentages in each nominal rating scale were estimated. However, the increase in clarity from working with means and standard deviations outweighed the loss of validity from inferring linear interval scale data.

In terms of confidence in using OR techniques, minute takers scored the lowest. Their mean scores before the exercise of 1.06 to 1.31 (except the travelling salesman problem 1.87) were lower than question experts (1.33-1.87), systems thinkers (1.4-1.9) and computing experts (1.67-2.17). The latter were most confident in finding computing solutions to problems (2.67) with minutes takers least so

(1.62). Negative value added represents the healthy scepticism of bitter experience for computing experts, on techniques such as depot location and Clarke Wright which appear to be appropriate to the case, but in fact are not, or need considerable adjustment.

The CCS assignment was divergent. Question experts were required to calculate costs and apply several OR techniques, and question 2a demanded a willingness to apply and question the use of several techniques, building genuine understanding rather than the simple product based knowledge of standard set-piece examination questions. In Question 1, numerically correct answers which require the loading and offloading of lorries onto ships for a 10-mile sea haul, when driving would be cheaper, beg simple common sense comment.

Computing and question experts might well be concerned by their inability to apply set-piece approaches. Less value was added for techniques not used extensively in CCS such as trans-shipment problems, and could be negative for systems thinkers who might be less confident in interpreting multiple answers to the same problem. The main value added for OR techniques was knowledge of them, with 0-11% knowing sufficient to use them before CCS, but 7-28% after, with systems (4-22%) providing a similar picture. With 5 roles in CCS, a total of 20% of students willing to use a technique suggests that the case study encouraged more students to be willing to apply, than merely know of, a wider range of techniques than did previous exam-based courses. Some cascade learning must have occurred as knowledge of programmes (30%) and systems (50%) exceeded the 20% of the group exposed to and presumably able to use them. After CCS, only 12% knew 'very little' about OR in business, and 22% the role of computing solutions to problems, with up to 42 and 39% knowing sufficient to use this material. If these figures are true, the course certainly achieved its prime objective.

Student attitudes to groupwork. This exercise increased the confidence and understanding of these students in teamwork, reported as only their second such exercise in two years of study. 70-77% felt that they knew sufficient to be able to work in groups before the exercise, (only 50% of computing experts) but rising to 89-96% after (89-100% of computing experts). Did students proffer these replies in order to raise their marks? It is unlikely with 3 weeks between responses, that they would remember earlier replies and content analysis of comments support this.

Nine per cent of students disliked groupwork beforehand, 49% didn't mind and 26% favoured it; after the case study, percentages were 2, 14 and 69% respectively. The experience was a positive one, with only 2%, mainly overworked question 1 experts, disliking it afterwards. Prior reservations such as 'I prefer to work alone', were replaced by after comments like 'its good if we all work together' (20%), 'it allows goals to be achieved', 'it gives support and encouragement', 'its real life', and 'it allows delegation'. In terms of group problem solving they noted 'it helps' (27%) and 'we can help each other' (13%). One group noted that 'problem solving in a group proved a successful way to motivate all members into generating ideas.. all became committed to the task and once the reliance on one another was established, the task became less daunting to all concerned.' Other observations related to a need for smaller groups being more appropriate (19%), although a few were for or against self-selection of groups, fear of free-riders was a problem for some students, as were the excess or variable quality of ideas, and need to stick with delegated roles. All students benefit from undertaking some groupwork, not necessarily in an OR context but it might be more appropriate earlier on in future years.

Roles. Defining roles reduced resource pressures preventing all students from being taught all material, and allowed students to choose roles. Some preferred computing and

quantitative work, viewed as 'interesting' or 'problem solving' but others sought refuge as minute takers or systems thinkers. The issue of ensuring a minimum 'skills set' for each individual is less of a problem here, as other syllabi tackle individual computing and quantitative skills. Minute-taking, seen as group leadership and non-numerate, was more attractive than more technical roles.

After the event, fewer (8-11 rather than 26% before) would choose roles 'most suitable for them. While some would still seek interesting or challenging roles (about 20% after), more (20% after, compared with 8% before) wished to avoid maths and computing, and more would chose roles using previous knowledge (eg minutes or computing). Role expectations were met by over 70%, but 20% of computing, systems and questions experts found tasks differed from expectations. Many found work harder than anticipated; some did not know what to expect. One group noted that 'the thought of having to rely on other group members who may have been unfamiliar with their specialist skills at the time...was slightly worrying'. Based on this evidence, it seems that once a set of core skills have been attained, students can benefit from adopting specific roles in some modules, sharing role experiences in group tasks.

Value added from the assessment. Applied OR subject knowledge and group experiences are overt outcomes of the CCS case, but peer and self awareness are less overt elements of its value added. In terms of peer assessment, in the group mark, 5 roles were each marked out of 15 by the lecturer (LM, total 75) and out of 5 by peer assessed marks (PAM, total 25), allowing comparison of LM and PAM. No student chose the option to weight their individual role marks as 50% of the total. Informal comments indicated lack of confidence in their own role performance, blurring of role tasks (only noted by 1 student in the questionnaire), and genuine desire for a teamwork approach based on group loyalty.

Before awarding PAM, students were told that a penalty would be awarded for giving everybody maximum marks, and none did. PA forms were handed out with the assessment, allowing collusion, but there is little evidence of it. The alternative, with problems of dealing with absent students, if completed in class, seemed less desirable. One student made no peer assessments, and 11 did not assess their own role including 6 from one group, reflecting reluctance or inability to do so. Possibly, the weighting of PA should be raised. Also, criteria for assessment between LM and PAM differed, with PAM including such elements as contribution to the group and sharing of specialist resources which I was unable to monitor. Minimum marks were 20% on either scheme, (1 on all criteria) with 100% the upper mark.

For each of the 7 groups, a mean LM scored out of 25 for each of the 5 roles, and PAM out of 15 was available. Statistical analysis revealed a weak rising relationship between them when plotted, and both approximated a normal distribution. With a correlation coefficient of .531, LM 'explained' 28% of the variation in PAM, with a 99.9% certainty that this is not merely a 'chance' relationship. The regression relationship was :

$$\text{PAM} = 10.4 + .583 \text{ LM} \quad [1]$$

All parameters were at least 99.9% significant with the usual assumptions of the Pearson regression model being met. Apparently, PAM based on a wider range of criteria (possibly more valid) are similar in reliability to LM.

Student reactions to PA included 15% with an intense dislike before, but none after assessment; it was 'fine' for 72% after but only 28% before. Fears of free-riders (38 to 16%), distrust (10 to 7%) and working together (19 to 14%) also fell after the assessment. Comments of relief, learning to pull together, part of teamwork and requests for marking as a group were made, but 5% felt that marks were

out of their control. Overall, PA like group-work, was accepted after trying it.

Was the same value added in each role or did any particular role receive consistently lower marks? An analysis of variance revealed that we could be 95% certain that there was no significant difference between role scores using either method of marking. [If we rejected the null hypothesis of no difference there would be a 23 chance of a type 1 error for LM and 47% for PAM data]. Table 4 shows detailed results.

Table 4. Comparison of PAM and LM marks

Role	Minutes	Computing	Systems	Q1	Q2
LM: Mean	16.1	16.0	16.6	15.3	14.8
sd	2.0	1.3	0.6	1.5	1.6
ASM: Mean	10.0	9.3	9.4	8.7	8.9
sd.	1.3	0.5	1.3	1.6	1.9

Question experts (Q1,Q2) scored lower in PAM and LM, but minutes and computing experts fared better. Some marks are inversely related to question complexity with some question specialists showing negative value added in rating their ability to use techniques. Healthy scepticism is to be encouraged, as industrial applications can be complex and daunting.

Was PA reliable across each role criterion within a group? For a student to grow in self awareness (a potential value added by the assessment), he must have confidence in PAM. This is unlikely if there is great variation in marks for each criterion. Results for CCS for 20 criteria in 7 groups (too detailed to report here) show generally low standard deviations.

Limitations of the study. Module and course leader comments were few and far between, indicating few student fears and complaints, and a good response to the whole approach. Triangulation via lecturer's diary, student records and self assessment forms raise some issues for delivery of similar courses: 'the

work was a useful challenge for more than just the purpose of answering the questions. Unfortunately... set in the summer it caused great frustration. We were unable to commit as much time and effort to this project as we would have liked, and have not achieved our potential on what could be an enjoyable and exciting challenge'. 'More specialist lectures would help but time may not allow them'. 'Too many concepts crammed into too little lecture time'. 'If we had sat together [as a group] from the start, we would have become more knowledgeable as a unit, of the problems ahead'.

Many points raised above (Section 3) were indeed noted by students, but they also recognised the resource issues involved and the reasoning for the approach adopted. Although not widely reported, examples were '[there is] scope for a member to be carried along by the rest', '[there are] problems communicating with the group due to dependence on attending the 4th consecutive hour in the same room'.

Although no student noted the lack of familiarity with peer and self assessment procedures, the issue of an insufficient overview was raised where 'it is possible that no one member will have a full appreciation of the subject area in question'. The issue of imposed groups was raised in a concern for 'a risk that not all members would participate equally. However in the real world groups are rarely self selected.' Finally, one group commenting on 'this part of the course' referred to it 'in two modules', alluding to other classes in quantitative methods. This shows uncertainty in how many students perceive any class with a quantitative methods label, bringing with it a baggage of fears whichever approach is adopted.

5. DISCUSSION

Although based on only one class, some findings noted here may be of wider interest to maritime business teachers, provided that they are aware of the following points. Firstly, the

content analyses of student attitudes reported here were based on only 2 responses per person per question: it does not imply that respondents would not agree with other points raised if prompted to do so. Also, comments drawn from student diaries may over-reflect the views of minute takers, who generally feared computing and mathematics, but few such comments were raised by those in computing roles. Finally, the approach was presented and analysed as a whole, with no guarantee that any of its constituent parts would succeed elsewhere if taken in isolation.

The approach was resource efficient without compromising educational quality. In particular, specialist roles provided one device whereby those so inclined could gain hands on computing experience. However, although the overall course aims were achieved here, a skills gap could develop on courses elsewhere which lack a mandatory core skills programme where some students may for example seek to avoid mathematics. Some cascade learning occurred, but there was limited interest in other roles. One group noted 'it is a shame that only the chosen few had the chance to experience applicable software programmes due to lack of time and resources.'

Assessment forms speeded up marking and improved the legibility of comments given to students, and the group coursework cut marking time, whilst still making substantial and valid demands on students, although groups were probably too large in this case. The approach yielded powerful insights into student views of groupwork and group dynamics, and it is gratifying to record unprompted evidence of successful teaching. Williams' [9] 'deep learning' occurred where one group noted that '...unlike an exam, work does not have to be learned parrot fashion only to be forgotten two weeks after the exam'. The comment that '...we learned the importance of listening to everyone's point of view and critically analysing all comments' is evidence of 'enterprising behaviour'. In educational terms, shipping OR case

studies designed for postgraduates can benefit undergraduates when working in groups and with fewer time constraints imposed. Students gained a richer and broader experience when the examination element was removed, with evidence of fewer complaints, genuine interest and more relaxed and reflective work. The teamwork and industrial realism which students were exposed to gave major benefits in the affective domain, with major shifts in attitude occurring.

Peer assessment was accepted by most students and on this evidence appears to be as reliable as tutor marking, and by assessing a wider range of skills including personal contributions to a group, it may be more valid. Complex PA factors [Goldfinch, 8] were not needed here, but gradual introduction to PA is essential as some students here were not comfortable with PA, and around 20% did not attempt self-assessment. Peer assessment represents a transfer of power, releasing social forces which demand careful handling. This occurred where students in one group felt it was unfair for 'free riders' to receive the same mark as themselves, but equally felt they should not fail.

The case study with divergent and computer based solutions challenged students to question how they attempt to handle complex problems, an important process approach with formative elements to it. One group noted that '[A case study] is a good way of assessing statistics because it is quite a few peoples' weakest subject and [working] in a group lessens the pressure and helps people who have difficulty understanding.' Are they better prepared for a career in maritime business as a result?

References

1. Lawson, C. On the relation between course structure, teaching methods and evaluation procedures in economics. *Assessment and Evaluation in Higher Education*. pp.1-10 Vol.17. No. 1 Spring 1992.
2. Marzen, V. Planning for political, environmental and industrial management. *Proceedings of the VI-th Congress of the International Maritime Association of the Mediterranean* Volume 1, Bulgaria, 1993, p.199.
3. White, L. Undergraduate competencies which faculty value. *Assessment and Evaluation in Higher Education*. pp.199-214 Vol.16 No.3 Autumn 1991.
4. White, L. (1991) op.cit. p.200.
5. Dinwoodie, J. *Shipping Operational Research: In hard cases or soft ?* Working Paper No. 17. Department of Shipping and Transport Plymouth Polytechnic July 1988. 63pp.
6. Gibbs, G. *Assessing More Students*. Centre for Staff Development, Oxford Polytechnic, 1992, p.27.
7. Gibbs, G. Habeshaw, S. Habeshaw, T. 53 *Interesting Ways to Assess Your Students*. Technical and Educational Services Ltd. 1988.
8. Goldfinch J., Raeside R. Development of a peer assessment technique for obtaining individual marks on a group project. *Assessment and Evaluation in Higher Education*. pp. 210-231. Vol.15. No.3 Autumn 1990.
9. Williams, E. Student attitudes towards approaches to learning and assessment. *Assessment and Evaluation in Higher Education*. pp.45-58. Vol. 17. No. 1. Spring 1992.
10. Williams, E. (1992). op.cit. p.45.
11. Gibbs, G. Habeshaw, S. Habeshaw, T. 53 *Interesting Ways to Assess Your Students*. Technical and Educational Services Ltd. 1988 p.15.
12. Fish, D. But Can You Prove It? Quality assurance and the reflective practitioner. *Assessment and Evaluation in Higher Education*, Vol.16. No.1, 1991 pp. 22-36.
13. Fish, D. (1991) op.cit. p.30.
1. Lawson, C. On the relation between course structure, teaching methods and evaluation procedures in economics. *Assessment and*

Paper 9

Antidotes to Automated Learning Syndrome as Observed in Some Maritime Business Classrooms

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Introduction

Capital intensive teaching methods may enable learners to take increasing control over parts of their learning experiences (e.g. Kachelmeier et al.1992), but when combined with pressures to modularise and semesterise courses, overall course teaching and assessment objectives can be dispersed into ever smaller units of fragmented courses. Monitoring individual student learning experiences may be fraught, as self contained skills-based modules of study, each employing technology based learning (TBL) strategies are provided for large groups of students. In this environment, teachers must be aware that 'automated learning syndrome' (ALS) may develop, and corrective action may be required if TBL resources are to be employed to maximum effect.

Employing a medical analogy, some Maritime Business (MBU) and Transport (TRN) undergraduates at Plymouth appear to exhibit ALS. The prognosis is an impressive ability to generate complex computer output, but a pervading inability to understand why it is needed, or how the results which it conveys have been derived. A diagnosis identifies an overreliance on TBL resources, although remedies encouraging complementary approaches to TBL are available. These can involve more 'hands-off' computing classes, where students conduct literature searches of published works in subject-specialist contexts of their choice and analyse studies which have employed the same technologies which they had been empowered to replicate for themselves. Another approach requires students to write essays about the validity and testing of assumptions on which techniques were based, interpreting and criticising published results. Other strategies include groupwork exercises, requiring an overview negotiated with peers regarding the role and validity of the techniques employed in particular problem contexts. Finally, oral or hand-written presentations provide an antidote to overreliance on mechanically printed reports.

In this paper, strategies for assessing TBL, and minimising ALS, are placed in the wider context of taxonomies of objectives for technical education. Before outlining Carter's (1985) taxonomy designed for educating professionals in engineering, some strategies used by accounts teachers for evaluating TBL are outlined. Antidotes devised by quantitative methods (QM) teachers, to minimise the occurrence of phenomena akin to ALS are reviewed, and the potential for students in the Plymouth modular MBU/TRN scheme to choose courses which may overexpose them to TBL is discussed along with practical antidotes to ALS. The final section reiterates the need for TBL strategies to be evaluated within a formal taxonomy of objectives for professional education, such as Carter's.

Literature Review

Some strategies for evaluating TBL in accounts teaching

The use of taxonomies of educational objectives for evaluating teaching and learning strategies is not new. Teachers attempting to juggle knowledge, emotional and physical skills objectives in courses happily embraced the cognitive domain (Bloom et al. 1956), paid lip service to the affective (Bloom et al. 1964) but neglected psychomotor elements. Whether they succeeded in producing rounded professionals is a moot point, but the growth in TBL challenges business teachers to reappraise the role of skills in professional education, and review their taxonomies for evaluating strategies for TBL. The debate is more advanced in technical disciplines, including engineering (Carter 1985), mathematics (Scott 1985) and accounting (Friedlan 1995, Nicholson 1995), but in MBU/TRN courses, good practice is not so well established. A review of strategies for evaluating TBL used in accounts education reveals attempts to highlight the impact of learning strategies on various skills outcomes, and limited appeals to often tentative or implicit taxonomies.

Typically, Kachelmeier et al.'s (1992) evaluation based on simple statistical comparison of examination scores of students who used a computerised worked example for teaching pension plan accounting

and traditional unguided problem solving approaches revealed many advantages. However, in the absence of assessment in relation to a formal taxonomy, it remains an isolated attempt to avoid 'cognitive overload or overreliance on the computer at the expense of a substantive understanding of underlying concepts'. Comprehensive checklist evaluations of TBL materials can point to imbalances between the observed learning activities of participants using them, and procedures which designers intended where 'some students limited their interactivity to the printing out of each page of examples' (Nicholson 1995, 101). Although an excellent method for testing whether learning outcomes are as intended, such evaluation is largely cognitive, and remains limited to individual learning materials.

With only an implicit appeal to a broader taxonomy, Frederickson et al.(1995) attempted to build a constrained optimisation model of the accounts teacher's objective to minimise the imbalance between accounting competencies demanded by employers and those possessed by graduates. Skills demands listed included general and technical knowledge, skills, attitudes and the role that these play in job performance. If the imbalance is too large, employers will recruit non-accountants and train them in-house, but the demand for general management skills is gradually supplanting technical accounting competence, and the precise skills demanded vary between employers, and over time. Surveys of accounting graduates showed them feeling well prepared in computer programming skills, but less so in networking and computer communication skills, considering their overall preparation to be low.

Within a discussion of the role of case studies in accounting education, Davies & Crowther (1996) employ Bloom's (1956) taxonomy to assess their wider educational effectiveness. However, they then proceed to consider subject-specific objectives of such approaches as largely cognitive, representing their affective and skills development benefits as mere devices for encouraging transferable skills development in students. At the other extreme, Snaith & Hobbs (1996) use a pure competencies approach to assess the effectiveness of IT skills acquisition as a transferable skill, but neither approach attempts to assess the overall role of TBL in producing a rounded professional.

Friedlan (1995) sought to determine whether traditional lecture and technically based introductory accounting courses could develop students' perceived skills and abilities required for success by accounting practitioners, as effectively as a nontraditional course incorporating applications, prescriptive minicases and an interactive classroom approach. These perceptions of introductory teaching may establish stereotypes of different careers (Holland 1966) and influence the ability of a profession to attract able recruits into its ranks (Cohen and Hanno 1993). In comparing the two approaches, Friedlan employed a skills based taxonomy incorporating technical and intellectual, problem solving and communication elements. Overall, non-traditional methods were more effective in influencing perceptions, with, for example, the perceived importance of problem solving skills and an ability to identify problems which needed to be solved growing in stature following teaching for this group, but not changing in the other group.

In evaluating the impact of varying inputs of accounting systems knowledge and software-specific training on knowledge, skill, self efficacy and computer anxiety, Stone et al. (1996) drew on several taxonomies of objectives (e.g. Bloom et.al. 1956, Carter 1985). Their prime concern was action-based, aiming to increase their students' ability to perform specific tasks by applying facts and concepts, or applying abstract concepts to specific problems, with both actions predicated by adequate knowledge. Findings that software specific training not only increases such knowledge and skill but also students' perceived ability to perform such tasks, implies that a good learning strategy can achieve cognitive, affective and psychomotor outcomes.

In order to evaluate the contribution of TBL strategies to the wider educational process for MBU/TRN students, and avoid relegating the issue to a 'transferable skills' course, a formal taxonomy of learning objectives is needed to provide a framework within which symptoms of ALS can be referenced. Carter's (1985) taxonomy for professionals in engineering, itself a technical discipline, can assist in evaluating TBL strategies and highlight antidotes to ALS.

Carter's taxonomy

Carter's (1985) taxonomy of objectives for professional education (Table 1) aimed to develop a macro-design set of objectives for engineers, based on competencies including, being, - relating to personal qualities; doing, - related to skills elements and knowing, including knowledge elements.

Personal qualities	
<i>Mental characteristics:</i>	openness agility imagination creativity
<i>Attitudes & values:</i>	things, self, people, groups, ideas
<i>Personality characteristics:</i>	integrity, initiative, industry, emotional resilience
<i>Spiritual qualities:</i>	appreciation, response
Skills	
<i>Mental:</i>	organisation, analysis, evaluation, synthesis
<i>Information:</i>	acquisition, recording, remembering, communication
<i>Action:</i>	manual, organising, decision making, problem solving
<i>Social:</i>	cooperation, leadership, negotiation / persuasion, interviewing
Knowing	
<i>Factual knowledge / Cognitive:</i>	facts, structures, procedures, concepts, principles
<i>Experiential knowledge/affective:</i>	experience, internalisation, generalisation, abstraction

Table 1. Elements of Carter's (1985) taxonomy

Such knowledge is either possessed or is not possessed, with varying levels of skills demonstrating varying degrees of ability to complete a particular task. Other types of knowledge include experiential knowledge, which can not be learned but is acquired through experience, and factual knowledge which reflects cognitive knowledge and understanding. Carter's concern was that professions whose members must deal with people and whose work environment demanded cooperation between people, must also ensure sufficient levels of development of social skills in their professionals. Such skills objectives demand some measure of competence of ability to perform these tasks, along with a requirement for information skills including foreign language abilities and social skills, and skills assessment which may be subjective involving personal, spiritual or values skills. New teaching methods, aimed at moving away from purely technician values to liberally educating the whole person, also generate antidotes to ALS.

Strategies of QM teachers to minimise ALS

QM teaching in transport

Similar symptoms to ALS, and some tentative remedies, were observed on QM courses in Transport delivered before the advent of modern educational technology. Examiners (Plymouth Polytechnic 1985) on an undergraduate QM module typically recording a 74% pass rate pre-1985, compared with 93% in 1986, noted that 'the high failure rate...remained a concern...Emphasis is now placed on statistical modelling in Transport Operations rather than on statistical and OR techniques.' Another QM paper where 'candidates ..know the basic formula or method but cannot apply this to a practical situation' (CIT 1988) was later withdrawn. Surely, such a fate awaits TBL courses which fail to enhance overall learning within their host discipline.

Fundamental questions, still being addressed by the TBL debate in business education, but worthy of discussion in the context of Carter's (1985) model, relate to:

- why teach QM/TBL at all ?
- could students views of courses help to minimise ALS ?
- should we teach the art of modelling rather than model building ?

Why teach QM/TBL at all ?

If few business graduates will ever use QM/TBL in industry, and may fail their degrees through failing it, *why* teach it at all? While 'the point' must be made much clearer if its benefits are to be appreciated (Ormell 1992), it must also be explicit, akin to Carter's (1985) spiritual quality whereby a subject must be 'appreciated' before any learning response follows. Although Scott (1985) dismissed reasons of a 'desire to be educated' and 'providing an entree into a job', on vocational business courses employability and social relevance may be important outcomes for judging course content, where courses which do not appeal to students simply do not run. 'Getting a sense of achievement out of

learning the routines' would meet Carter's lowest level 'mental' characteristic, but in turn deny higher concepts of agility and imagination, whose absence are symptomatic of ALS.

Better reasons for studying QM and in turn minimising ALS were to:

- appreciate the power and elegance of mathematics via intelligible examples (akin to Carter's spiritual qualities).
- understand important mathematical theorems and processes and stimulate the intellect, involving initiative, solving unfamiliar problems, and creativity. These combine Carter's mental characteristics and skills.
- solve unfamiliar problems as they are decomposed, experimented with, patterns are sought, simpler formulations are attempted and solved, hypotheses are formed, relationships sought, conclusions checked, findings communicated and generalised, and what you should do when you 'get stuck' is analysed. Creative skills in setting one's own questions, and searching for simple structures are developed. Qualities of initiative, investigative skill and imagination, asking perceptive questions, noticing new relationships and forming new associations, and communicating ideas are all involved. While this addresses Carter's personality characteristics, action skills, attitudes and values, and information skills elements, at the heart of vocational education, other business contexts may provide more relevant problem contexts, even if QM provides more difficult problems or an efficient medium within which to develop problem solving skills. Scott's (1985) claim that skills acquired in learning to solve problems should extend to 'financial, moral, personal, aesthetic, philosophical, theological and spiritual dimensions' of life is grander than Carter's appeal to social skills within an explicit hierarchy of cooperation, leadership, negotiation, persuasion and interviewing. Relevant teaching methods involving group and project work, open ended problems and applied problem solving should provide antidotes to ALS.

Could students views of courses help to minimise ALS ?

A teacher responding to Carter's (1985) concept of attitudes to people and groups and encouraging social skills in the learning process, will find antidotes to ALS. The link between reactions to introductory classes in accounts and perceptions of the professional workplace has already been noted (Friedlan 1995, Cohen and Hanno 1993) but student reactions to introductory QM courses provide additional insights into how to avoid ALS. Lo (1990) reporting on a student evaluation of introductory statistics teaching, noted a need for initial classes to be aimed at reducing student anxiety, with statistics considered one of the most difficult subjects on the study programme. In the process, small groups of students working together and sharing responsibilities for progress were found to learn better, with regular class contact helping to raise understanding, with students preferring smaller groups, formed during their earlier learning experiences. Spencer (1992) analysed the relationship between student and tutor in large classes, optimally standardised to ensure consistency and quality with a maximum class size of 20 (or 30 with two staff in attendance). In terms of teaching method, Lo (1990) noted that applications should dominate the teaching process, with students needing to understand the results of statistical research reported in journals. Carter's concept of attitudes to people and groups, can provide antidotes to ALS through encouraging social skills in the learning process.

Should we teach the art of modelling rather than model building ?

ALS represents a failure to advance beyond 'procedural' skills in Carter's cognitive taxonomy, where concrete 'facts' are not transformed into structures, concepts and principles. Similarly, in the affective domain, ALS denies progression beyond experience and internalisation into generalisation and abstraction with an inability to understand unfamiliar problem contexts. In distinguishing between models as representations of real world situations, and modelling, a process of determining which models are appropriate or useful in given situations, Hartley (1983) noted that students were consistently unable to model new and unfamiliar situations, a feature of ALS. Hartley's response involved students qualitatively considering the purpose of the client and imperative variables though to be actively present in the situation, iteratively creating or modifying the structure and evaluating the usefulness of the model, and finally interactively expanding the list of active variables. In terms of Carter's taxonomy, this represents an attempt both to develop higher experiential skills, and a full range of social skills, both presenting antidotes to ALS. Attempts by Finlay (1986) to encourage 'students in formulating situations in management into

mathematical modelling' relied heavily on cognitive elements of Carter's taxonomy, aiming to take non-numerate topics, such as personnel, to teach numerate examples. However, the account of the problems encountered is closely akin to a catalogue of the symptoms of ALS. Other QM practitioners included Ellis (1992) who explicitly attempted to develop information, action and social skills in Carter's taxonomy, via group work and problem solving, with assessed oral reports. Kathawala (1988) noted that one major barrier to USA businesses using more models arose where graduates familiar with such techniques could not communicate in business English or mix socially in the workplace, reflecting incompetence in information and social skills.

Some strategies for reducing ALS in MBU/TRN classes

A balanced range of modular experiences

Monitoring individual student learning experiences in a modular degree scheme can become increasingly difficult for programme managers as the range of course options available increases. In such situations, one strategy for ensuring a minimal diversity of learning experiences could be via prescribed core studies which incorporate a range of teaching and assessment media (Davies & Crowther, 1996). Typically, these might include a balance of group and individual work, case studies and tests, seen and unseen, computer and hand based, and open and closed book materials, addressing a range of Carter's (1985) attitude, information, action and social skills in addition to cognitive elements. In a modular degree system, some course combinations could reduce the pedagogic experiences of students to that of the 'automated learner' for up to 30-50% of some stages of their programmes (see Table 2), but attempts to avoid minimal exposure to TBL are equally undesirable. Awareness of Carter's taxonomy can provide course programme planners with a checklist of desirable experiences for their students to engage in.

Semester: 6 pathways are studied for each of 6 semesters					
1	2	3	4	5	6
<u>TRANSFERABLE SKILLS</u>					
Word -, processing. Descriptive statistics.	<i>Hypothesis testing. Modelling Spreadsheets</i>	Non-parametrics Multivariate model	... fieldwork	project	project
<u>ECONOMICS (Transport or Maritime)</u>					
Self learning packages				forecasting,	econometrics
<u>BUSINESS FUNCTIONS (Transport/Maritime)</u>					
	Introductory accounts	Discounted cash flows		Scenario planning more econometrics	
<u>OPTIONS:</u>					
TRANSPORT PLANNING		Surveying, sampling; demand models, linear programmes, depot location, simulation..links with policy..Class & lab			
LOGISTICS		Routing, scheduling, algorithms			
PORTS/ TERMINALS		Queuing theory, inventory models, project planning			
MARITIME LAW (1 & 2)		case data bases			
TRANSPORT TECHNOLOGY		modelling throughout			

Table 2. Some typical MBU/TRN degree pathways at Plymouth
Only *italicised items* are normally classroom based

Alternative strategies for teaching introductory statistics

Historically, statisticians had used lectures and laboratories to teach introductory statistics to groups of about 20 students, but this policy of using service staff and demonstrators was suddenly reversed. Despite protests, the problem became one of attempting to teach introductory statistics to a mixed group of 110 transport, fisheries and shipping students using minimal resources. A laboratory with 20 terminals was available for 2 hours per week, for 25 weeks, but no other lecture theatres were available. The evolution of three strategies for handling this situation within the course team are described in Tables 3 to 5, based on ongoing reviews of staff, computing and room resources available, target student groups, teaching strategy, skills and methods audits, and assessment strategies. In addition a variety of student and staff feedback mechanisms were involved, including open ended and structured questionnaires.

<u>Situation:</u>	110 transport, fisheries and shipping students. A laboratory with 20 terminals available for 2 hours per week, for 25 weeks. No lecture theatres available.
<u>Syllabus:</u>	The nature, interpretation & presentation of statistical data; sampling procedures; frequency distributions; measures of location & dispersion; Intro. to hypothesis testing & statistical significance; linear regression & correlation.
<u>Teaching strategy:</u>	No formal sessions: a weekly workbook, laboratory based; students keep a logbook of work done and problems encountered.
<u>Assessment strategy:</u>	To test factual knowledge and experiential knowledge of competence via ability to perform statistical computing tasks. Social skills were not addressed elsewhere on the course at this time.
<u>Assessment:</u>	Working in groups of up to five, in a detailed context of your choice: • Explain, using relevant literature, the research background to your chosen problem • Set up a working research hypothesis. Add statistical hypotheses which you can test • Obtain and analyse data which describe your chosen problem context statistically. • Test your statistical hypotheses and report your findings fully • Evaluate the importance of your findings, particularly in relation to any statistical assumptions which were involved in your tests.
<u>Review:</u>	Serious concerns over resourcing; • Inadequate staff supervision of skills development • Student reports too long..up to 400 pages • Attitude, information, action, social skills well developed

TABLE 3: Strategy One: Stage 1 Statistics in MBU/TRN

2 years later with more experienced resource managers	
<u>Situation:</u>	90 students had received 45 hours of individual hands-on laboratory tuition in word processing, descriptive & inferential statistics using spreadsheets. These sessions covered 1 hour lecture + 1-hour classroom tutorial (repeated twice) for 7 weeks. (2 hours of laboratory based spreadsheet teaching for 7 weeks would follow).
<u>Aims:</u>	To develop an understanding of distributions, and relationships between variables encountered in operational problems, and their applications to decision making in shipping and transport.
<u>Content:</u>	Introduction to hypothesis testing and statistical significance; linear regression and correlation.
<u>Assessment:</u>	[same aim as above]. A closed book in class test, with the title given to students at the start of the course. In a shipping or transport context of your choice explain the importance in regression modelling of: • hypothesis tests on the intercept, slope and correlation coefficients • analysing residuals from the regression.
<u>Review:</u>	• This assessment proved to be a good discriminator • Students undertook too little breadth of reading • Was it merely a memory test ? • Little social skills development, but other classes did address this specifically. • Attitude and information skills were addressed.

TABLE 4: Strategy Two, Stage 1 Statistics In MBU/TRN

<u>Situation, aims, content</u> , as in Table 4	
<u>Assessment:</u>	a coursework In one detailed areas of [shipping or transport] of your choice: • Describe and explain situations in which regression modelling had been used • Explain fully with at least one numerical example how and why statistical tests on the intercept, slope and correlation coefficients have been conducted • Evaluate the analysis of residuals from the regression
<u>Review:</u>	• it is too early to say yet but attitude and information skills are well developed • some concerns regarding the role of action and social skills. Would a groupwork be <u>more appropriate in future ?</u>

TABLE 5: Strategy Three, Stage 1 Statistics MBU/TRN

Conclusions

Symptoms of ALS include:

- an ability using TBL to generate solutions to structured problems
- an inability to formulate, test and evaluate results from exploratory hypotheses in unfamiliar subject-specific contexts

It stems from :

- a failure to structure learning strategies with an appropriate taxonomy of objectives.
- over dependence on cognitive objectives, aimed at abstract higher levels rather than progression via concrete examples and subject-specific applications
- over assessment of information skills such as remembering rather than communicating
- failure to address 'spiritual' qualities where appreciation precedes response, or social skills via groupwork exercises.

Teaching which aims to minimise ALS should encourage:

- a taxonomy of objectives for professional courses (eg Carter's, 1985)
- students to apply and understand problem contexts relevant to their own needs.
- a variety of assessment methods involving real, 'messy' industrial problems where students report in depth, concentrating on problem formulation, solution by computer packages and critically evaluate solutions
- students to ask the right questions and progress from suboptimal solutions
- students to work in groups.

If graduates fail to display these skills, we need to ask whether a taxonomy of professional objectives underpinned their learning, and if so, to review the taxonomy. Teachers who apply Carter's (1985) taxonomy, are more likely to communicate, negotiate and value each other's roles, reducing the occurrence of learning conditions where ALS thrives.

Bibliography

- Bloom, B.S., Englehart, M.D., Furst, E.J., Hill, W.H., Krathwohl, D.R., (1956) *Taxonomy of Educational Objectives, The Classification of Educational Goals, Handbook 1 : Cognitive Domain*, Longman.
- Bloom, B.S., Krathwohl, D.R., Masia, B.B. (1964): *Taxonomy of Educational Objectives, Book 2, Affective Domain*, Longman.
- Carter, R. (1985) A Taxonomy of Objectives for Professional Education. *Studies in Higher Education*, 10, 1985, pp.135-149.
- Chartered Institute of Transport (1988), *Examiners' report on the Qualifying Examination C.I.T.*, London, 1988.
- Cohen, J., Hanno, D.M. (1993) An analysis of underlying constructs affecting the choice of accounting as a major. *Issues in Accounting Education*, 8, 2, 1993, pp.219-238.
- Davies, M.L. & Crowther, D.E.A. (1996). Case studies in teaching accounting - the way forward using multimedia as a delivery vehicle. *CTI Accounting Finance and Management 7th Annual Conference*, Brighton, 1996, pp.12-19.
- Ellis, N. (1992) Dynamic analysis of local train services. *Teaching Mathematics and its Applications*, 11, 1, 1992, pp.8-11.
- Finlay, N.P., King, M. (1986) Teaching management students to love mathematical modelling. *Teaching Mathematics and its Applications*, 5, 1, 1986, pp.31-37.
- Frederickson, J.R., Pratt, J. (1995) A model of the accounting education process. *Issues in Accounting Education* 10, 2, 1995, pp.229-246.
- Friedlan, J.M. (1995) The effects of different teaching approaches on students' perceptions of the skills needed for success in accounting courses and by practicing accountants. *Issues in Accounting Education* 10, 1, 1995, pp.47-63
- Hartley, P., Haynes, D. (1982) Teaching modelling. *Teaching Mathematics and its Applications*, 1, 3, 1982, pp.112-116

- Holland, J.L. (1966), *The Psychology of Vocational choice*. Waltham MA:Blaisdell Publishing Company, 1966.
- Kachelmeier, S.J., Jones, J.D., Keller, J.A. (1992) Evaluating the effectiveness of a computer intensive learning aid for teaching pension accounting. *Issues in Accounting Education*, 7,2, 1992, pp.164-178.
- Kathawala, Y. (1988) Applications of quantitative techniques in large & small organisations in the UK: An empirical analysis. *Journal of the Operational Research Society*. 38,11, 1988, pp.981-989.
- Lo, S.K., Stevenson, M. (1992) Attitudes and perceived usefulness of statistics among health science students. *International Journal of Mathematical Education in Science and Technology*, 22, 6, Nov.1992, pp.977-983.
- Nicholson, A. (1995) An Educational Framework for the development of an evaluation tool for CBL materials. *CTI Accounting Finance and Management*, 6th Annual Conference, Glasgow, 1995, pp.97-114.
- Ormell, C. (1992) Seeing the point of mathematics. *International Journal of Mathematical Education in Science and Technology*. 23,5, Sept.1992, pp.715-721.
- Plymouth Polytechnic (1985), *B.Sc Combined Honours Transport, Annual Review*, unpublished, 1985.
- Scott, W. (1985) Problem solving. *Teaching Mathematics and its Applications*. 4,3, 1985, pp.89-97.
- Snaith, J. & Hobbs, A. (1996). Competence development in computer laboratory environments: the learning experience of undergraduate students within a business school. *CTI Accounting Finance and Management* 7th Annual Conference, Brighton, 1996, pp.39-54.
- Spencer, N. (1992) Chaos or coordination: organisational aspects of tutoring large classes. *International Journal of Mathematical Education in Science and Technology*. 23,4, July 1992, pp.589-593.
- Stone, D.N., Arunachalam, V., Chandler, J.S (1996) Cross-cultural comparisons. An empirical investigation of knowledge, skill, self-efficacy and computer anxiety in accounting education. *Issues in Accounting Education*, 11,2, 1996, pp.345-376.

Paper 10

6 Learning through accident or academy?: the potential of classroom based study for developing competencies in managers of ferry services

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Abstract

In spite of rapid growth in demand which has stimulated new designs, new buildings and new levels of customer service in European ferry markets in recent years, less attention has been paid to the education and training requirements of the managers of these services. In an era of change, managers need to be fully prepared to face new challenges. This paper reviews some of the areas in which staff competence may need to be developed, and proposes a soft systems approach to defining their education and training needs. It is found that in developing their skills in both the cognitive and affective domains, there is a case for encouraging managers to seek further classroom based study. The implications of the approach, both in terms of defining desirable course outcomes and highlighting the measures which are likely to entice managers into the classroom are discussed.

Introduction

Rapid expansion and growth in the number of UK residents taking cruises (Lloyds List, 1995) and a doubling of the number of UK powered goods vehicles travelling to mainland Europe by ferry between 1986 and 1996 (DETR, 1997) even in the face of a Channel Tunnel opening, are examples of the recent expansion of demand for ferry and cruise services. Coupled with this, rapid technological change in the ferry market (James 1998), and ongoing concerns with safety issues (Hynds, 1998), have increased the pressures on the managers of ferry services. Not only have such changes increased the need for managers to update their technical knowledge and skills more fully, but they have also reduced the amount of free-time which individuals have at work within which to acquire them. Set against this background, this paper aims to investigate the type of knowledge and skills which may be acquired in the classroom which are appropriate for managers of ferry services, and to outline and evaluate a soft systems methodology for discussing how alternative methods of provision might best meet their educational and training needs.

Learning can be post-hoc, following reflection on how undesirable situations and outcomes could have been avoided, after sifting through the wreckage of previous disasters. Investigations into how accidents arose, such as cataloguing the events which took place for example with the Estonia ro-ro ferry (Lloyd's List, 1995b), involving failure of a bow visor door locking mechanism, which attempt to determine after the event whether a fault had occurred in the processes of building, operation or inspection, are fraught with problems. Actions by operators to weld bow doors shut, safety checks by inspectors, and discussions on amendments to the design process by the International Maritime Organisation will undoubtedly reduce the likelihood of similar mishaps being repeated, but must be viewed as reactive rather than proactive. Surely, if sufficient resources are allocated to preventative education and training which could minimise the possibilities of any future problems, they must represent money well spent.

In the second section of the paper literature relating to the cognitive, affective and other dimensions of professional development needs is discussed, before attempting to outline some of the particular needs of managers of ferry services. In the third section, a soft systems methodology is outlined, along with an attempt to apply it to the context of the educational and training needs of the context in hand in the fourth section. The fifth

section concludes by considering the implications of the approach, for designing an educational development programme, both in terms of defining desirable course outcomes and highlighting the measures which are likely to entice managers into the classroom.

Literature relating to professional development needs

What is the purpose of education ?

"Education can be defined as the process by which a person is enabled to deal more effectively with his environment. It includes the acquisition of knowledge and experience, and the personal development of each individual... it is a lifelong continuing process" (Davies, 1968, p.131).

Davies (1968) then proceeded to note that the immediate interest of a shipowner in this process would be limited to the narrow vocational training necessary to keep sufficient trained staff at sea running his vessels effectively, a sentiment echoed by Evangelista and Morvillo (1998) three decades later. However, Davies (1968) then recanted by noting that education could also play a role in the recruitment, retention and contentment of seafarers, all of which contributed to the efficient operation of ships.

At a societal level, human capital theory has long proposed a link between the stock of skills which a workforce possesses and its output in terms of productive capacity (Ashton and Green, 1997). However, instead of the individual owners of this capital buying and selling their skills in the market place, quasi slaves, each individual might discount their future income benefits against the perceived costs of any training. If the nature and benefits of training are generic, employees are likely to be willing to fund it, but costs are likely to be shared with an employer if it is specific. A major problem with this view is the failure of empirical evidence to support the hypothesised link between economic performance and spending or investment in training. This arises due to problems of firms not having objective data available, or the complexities of statistically isolating particular effects when data is available (Ashton and Green, 1996). In the light of these problems in isolating the particular financial or economic reasons for undertaking training, some discussion of its perceived behavioural impacts may be useful.

Many seafarers were probably attracted or influenced by stereotypes acquired through the ethnographical writings of experienced seamen. These accounts convey the camaraderie of life at sea (Lane, 1986) and the lore associated with particular operations, but how can teachers attempt to change perceptions arising from misconstruing due to misleading stereotypes? Teaching by objectives is based on the premise that the purpose of education is to help people to change, where objectives relate to students, and aims to teachers. Although teachers may aim to stimulate an interest in students, it is their objectives which state what students will be able to do as a result, such as to explain, to summarise, to criticise and so on. Many educational courses are dominated by knowledge based objectives, and physical skills where relevant, but for managers, skills objectives related to values may be equally important.

Underpinning much work in education, Bloom's (1964) taxonomy of educational objectives included cognitive, affective and psychomotor domains related to knowledge, values and physical skills respectively. Some cognitive issues are raised in this paper, but one aim is to examine how affective objectives may assist in designing courses in higher education for managers of ferry services, including course content, learning strategies and assessment methods. This involves investigating the nature of the affective domain and how students can be encouraged to progress within it, and later, how progression development might be recognised. Implications for course and syllabus content will also be considered, but there may be problems in implementing them, and limitations on the subject matter which is appropriate.

Cognitive objectives (Bloom, 1956) are well suited to testing managers' knowledge of particular procedures or legal requirements, where they may be requested to list, recall, state, select and display other basic skills. At higher levels, they may be asked to explain, formulate, and contrast material. Of more relevance to practitioners, the abilities to assess and use information to solve problems are associated with application skills, and to compare, contrast and differentiate are associated with analysis skills. In order to formulate operating plans and policies, the abilities to organise, argue and summarise are indicative of synthesis skills, and at the highest levels, the abilities to judge, evaluate, and criticise define the evaluation skills. As students progress to more complex higher order cognitive levels, evidence of their progress may be assessed objectively.

Later, Bloom (1964) acknowledged that the affective domain was more problematic in that no single ordering principle, such as complexity, guided its development. It was likely that affective objectives would not be stated precisely, or that teachers were unclear about which learning experiences might be appropriate to attaining these objectives. Even if they were clear about their objectives, assessment procedures may be less transparent.

Typically, teachers may be aware of the importance of desirable interests, attitudes and character development, and looking for evidence of it, but possibly only in exceptional cases would it be apparent. Signals from students may be confused, where the visible response offered might relate more to their perception of what a teacher wished to observe than being their natural or honest response, and the ethics of attempting to award grades for displaying particular philosophical values are dubious if these are considered to be the private preserve of the individual. Where indoctrination is defined as involving a combination of affective and cognitive objectives, many teachers may be wary of over-concentration on developing affective behaviour, preferring to restrict 'education' to the cognitive domain.

Affective objectives

At the lowest level, Bloom (1964) identified affective objectives relating to receiving skills, progressing through responding, valuing and organisation to characterisation. 'Receiving skills' include awareness, willingness to receive and selected attention. At the lowest level, the student is merely aware that something is happening, but an interest is beginning to form, which may not even be verbalised, and may develop into a 'willingness to receive'. This involves displaying attention when others speak, appreciation of cultural patterns exhibited by individuals from other groups and increase in sensitivity to human needs. 'Controlled or selected attention' is essential for managers of ferry services, as they must be alert to human values and changes in the mood of what is happening around them.

Many of the actions at the next level might be observed in for example cadet students, where evidence of understanding is apparent in their actions, as they display 'responding skills'. The initial concept of 'acquiescence in responding', apparent through a willingness to comply with and obey regulations, even if only through fear of the consequences of non-compliance, is long-familiar in the shipping literature (Moreby, 1968). They later become 'willing to respond' voluntarily, and may accept responsibility

for their own health or protection of the health of others, developing a 'satisfaction in response', indicated by an emotional response, such as enjoyment of self-expression, or taking pleasure in talking to many different kinds of people.

Students who 'value' do so by indicating that an object or activity possesses worth, with consistent behaviour indicating internalisation to the point that their attitude develops, and they are able to actively control their own behaviour. Without these skills, no individual could ever hope to lead others, and as 'acceptance of a value' increases, the desire to develop the ability to speak and write effectively, grow into a 'sense of kinship with human beings of all nations'. 'Preference for a value' is evident as students attempt to draw reticent members of a group into conversation, or through considering a range of viewpoints, eventually form opinions about them. Where a student has displayed 'commitment', it is likely that their convictions are sufficiently strong for them to be committed to ideas and ideals such as democracy, or faith in the power of reason and methods of experiment and discussion.

'Organisation' is first apparent where 'conceptualisation' of a value relates to judgements such as to the responsibility of society for conserving material resources, and 'organisation' of a value system might involve an ability to weigh social policies against standards of public welfare, rather than narrow interest groups. 'Characterisation by value' is apparent when the normal behaviour of an individual is guided by an internally consistent organised system, an important requirement of a shipping manager (Moreby, 1968). The person now possesses a 'generalised set' which is internally consistent, including a willingness to change their behaviour in the light of evidence and to make judgements in terms of the detail of their context, rather than in terms of fixed, dogmatic precepts. This stable and yet flexible approach, representing the hallmarks of a shipping manager's 'capacity for decision' (Moreby, 1968), is precisely the kind of skill which a dynamic marketplace demands of managers of ferry services. At the highest level, a view of the world which characterises the individual has been formed, and their code of behaviour is based on ethical principles consistent with a stable philosophy of life.

To an extent, if assessments of cognitive skills have been satisfactorily completed, aspiring managers will by implication have achieved certain affective skills, such as receiving. They will have demonstrated responding, by showing commitment to the course, and valuing, by displaying a belief in

the worth of its objectives. However, explicitly affective objectives of education for managers of ferry services must ultimately attempt to develop a usable 'organisation', and 'characterisation of values' which become apparent only in their actions and behaviours.

Bloom (1964) noted that affective traits such as setting one's own limitations and accepting them can be judged only in terms of objectives which the student sets for himself. In terms of vocational education (BTEC, 1984), personal qualities of students have been defined to include 'working effectively and with self-discipline, programming and planning, leading and following, working in groups and in isolation, appreciating the contexts of work and individual tasks, learning from experience and learning independently'.

Management competencies

As more power was being devolved to lower levels in organisations, the need to update Bloom's taxonomy of educational objectives became apparent. Carter (1985) for example argued that a new taxonomy was required for assessing professional education, with objectives for engineers (which could include ships' engineers) based on skills. Bloom failed to distinguish knowledge, which is either possessed or not, from skills, which relate to varying degrees of ability to complete a task. Carter's 'experiential knowledge', which is acquired through experience rather than learned, is similar to Bloom's affective domain, but 'factual knowledge' equates with Bloom's cognitive knowledge and understanding. Professions dealing with or involving co-operation with people demanded social development, which was not the prime concern of higher education. Skills objectives require some measure of competence of ability to perform tasks. 'Mental skills' equate Bloom's higher order cognitive domain, and 'action skills' psychomotor objectives. 'Information skills' may include foreign language abilities, and social skills were of limited importance to Bloom. Skills assessment may be subjective, especially relating to personal spiritual or values skills. In order to move away from the purely technician values of many engineering courses, liberal education of the whole person was needed, with experimentation in new teaching methods.

At the level of management training, the affective domain could not be side-stepped. Hirsch (1988) attempted to define a 'skill language' for what makes a manager, including personal attributes (types of people) and skills

and competencies (what managers need to know about and be able to do). A major problem arose in attempting to assess managers on the basis of multiple skills or personal attributes, where scores in cognitive tests were considered more important than scores in psychometric tests. Interest also grew relating to ethics in the workplace (Guy, 1990), involving promises, trust, respect, honesty, confidentiality and the like. Ethics are ideals of character and conduct, forming criteria for distinguishing right and wrong and unlike legal rules do not involve formal sanctions. Ethics underlie choices in decisions (Guy 1990), and are in turn driven by values which are core beliefs about what is intrinsically right and wrong. Approximately 95% of respondents in a survey considered that courses in business ethics should be available for all business students, and 93% considered company training should be provided. Ethics, an important business skill implicitly based on affective objectives, are acceptably encompassed by transferable key skills without overtones of indoctrination, allowing education in values to be packaged in an acceptable form. Academic awarding bodies preferred to concentrate on cognitive issues, leaving companies to instil their own value systems via graduate training schemes, and professional bodies to assess value sets via professional report files and other devices prior to affording corporate membership.

Definitions of competencies vary. Weightman (1994) defined them as underlying 'the behaviours thought necessary to achieve a desired outcome'. A competency was demonstrable when behaviour was successful, but many work behaviours were defined by competency lists or frameworks which also involved knowledge, understanding and personal attributes. Strebler *et al* (1997) distinguished between a 'competence' model based on a minimum set of standards of performance of activities within an occupation and 'competency', which referred to the behaviours, or underlying characteristics which an individual needed to demonstrate in performance of a job. One reason for introducing competencies into organisations is to assess and develop the need for individually targeted training, although the approach could be linked to performance and reward.

Many attempts have been made to define an acceptable set of competencies. These sets may relate to different levels of management, or levels of competence, including for example appreciation, knowledge, experience and ability to apply them, in a range of domains (Weightman, 1994). These might include issues of vision, planning skills, critical thinking, leadership skill, persistence, influence skills, interpersonal

relationships, self-confidence, development, empathy and stress tolerance. Other work has generated similar findings, with a review of five studies in the U.S.A. (O'Neil *et al*, 1997) finding that interpersonal and teamwork skills, the most important subset of skills, was also the most varied and ill-defined. Negotiation and conflict-resolution skills were important, as were leadership and the ability to work with others from diverse backgrounds. Personal characteristics such as self-esteem, motivation and responsibility were important in all cases. Apart from these skills, basic academic skills of reading and writing were considered important, followed by higher order thinking skills enabling individuals to respond to rapid changes, problem-solving, creativity, decision-making ability and 'learning how to learn'. Sinclair (1997) found that graduates in business felt that the workplace had had the greatest influence in developing their skills in communication and thinking, teamwork and professional knowledge. University lecturers had attached greater importance to developing theoretical knowledge outcomes than these skills, representing an area where change was needed at undergraduate level.

Education for managers of ferry services

What are the existing educational provisions for, and requirements of, managers of the cruise and ferry industry? Increasing numbers of managers in this, as in many other industries, are achieving ever higher levels of educational attainment. As one example, the qualifications of 69 contributors to a recent industrial conference (Cruise and Ferry, 1995) were analysed. All were members of relevant professional bodies, 68% were graduates, 25% possessed postgraduate qualifications, 7% were educated to doctoral level and 17% had sea-going experience. In general, those who made contributions relating to human relations issues were managers of operations, and many had recorded sea-going experience, but few had postgraduate qualifications. Perhaps one requirement is for flexible methods of educational provision, such as credit accumulation by attendance at short courses, or more opportunities for longer periods away from operational duties to be spent in the classroom, which enable deck officers and practising operations managers to gain relevant postgraduate qualifications. Existing training provision, relating to specific issues such as bridge management, is aimed at developing attitudes in addition to technical skills (Prew, 1998), but

is unlikely to provide a substitute for prolonged development in the classroom.

Traditional classroom education for aspiring managers of ferry services has been linked apparently to the cognitive domain. One example included the use of a case study (Dinwoodie, 1988) concerned ostensibly with testing the ability of students to apply the principles and techniques of operational research, and appropriate software, to an optimisation problem designed to produce operating schedules for a range of Cross Channel Ferry services. However, where the problem context did not immediately fit any of the standard techniques, it was also designed to encourage divergent thinking, encouraging students to seek ad hoc solution procedures to the problem in hand, in addition to developing a critical appreciation of available approaches. The apparent 'hard' problem, the mathematical solution to which involved moving 'wheeled vehicles' which were capable of movement by road, for a very short distance between two ports by sea, was not operationally sensible. When added to broader questions asking participants to outline a methodology with which they could consider the impact of a (then) future Channel Tunnel on their business regime, it also drew them into 'soft systems' thinking.

The benefits for students of this approach in the affective domain were also highlighted (Dinwoodie, 1997) when the same case study was administered to groups of undergraduates in Maritime Business classrooms. In terms of technical skills development, the exercise involved students adopting and rotating between roles including those of minute-takers, technical operational research and computing specialists, and systems thinkers, simulating experience of working in a problem solving environment within a multi-disciplinary team. This not only raised their motivation, but they also felt that a realistic industrial operating environment had been simulated. When coupled with peer assessment, the approach was shown to be capable of developing skills of teamwork and communication, reliability and critical self-evaluation, each representing personal developments in the affective domain which were preparing the individual for more effective performance in the workplace.

Having reviewed some of the approaches to professional educational and training development, it is now necessary to outline a soft systems approach to problem investigation. The aim of the paper is to establish how this methodology can be applied to the problem of devising an educational and

development strategy for managers of ferry services, initially from the viewpoint of a potential course provider.

Soft systems, education and managers of ferry services

The soft systems methodology

The ability of human beings to reflect on a situation before devising an action plan with which to intervene in it enables models to be built as an

“explicit interpretation of one’s understanding of a situation, or merely of one’s ideas about that situation. It can be expressed in mathematics, symbols or words, but it is essentially a description of entities, processes, or attributes and the relationships between them. It may be prescriptive or illustrative, but above all, it must be useful”.

Wilson (1990, p.24) modified the dictionary definition of a system as a “structured set of objects and or attributes together with the relationships between them” to cover human activity systems with “human beings undertaking purposeful activity” which usually takes places within social and cultural systems of interpersonal relationships between human beings. Natural systems consisting of relationships between physical entities, and designed systems which include abstract mathematical and language could also be defined. In well-structured, designed systems, ‘hard’ problems may be defined where the concern is one of how to perform a particular activity. However, in investigating complex human activity systems, it is first necessary to define what an activity is, involving a complex set of ‘soft’ relations between elements in the system, before considering how an activity should be undertaken, or how any proposed changes may be implemented. At best, if an expression of concern has been made about a problem situation, the analyst can only attempt to investigate the situation and make recommendations which may then alleviate the concerns of the problem owner.

Figure 6.1 represents one recent unstructured view of the system of ferry services and concerns expressed within it, but several issues need to be addressed in attempting to structure this problem. Firstly, the boundary of the study area must be delineated, along with the interactions which exist in relation to this boundary. The current area of concern, ferry services in

Europe, includes both passenger and freight movements, but excludes most coastal shipping and may include some cruise operations. Secondly, in terms of the kind of activities likely to be present within this area, issues relate to marketing, competition, consumer tastes, technology and safety, but human factors are also featured.

Before attempting to design a training and education system, a question relating to how a particular purpose is to be achieved, the softer issue of what the real problem might be, and hence what needs to be designed, must be addressed. Systems analysis is holistic, concerned with the emergent properties of wholes, where educational issues for example can not be divorced from the broader human resource and corporate development systems. These are modelled as an interconnected set of activities needed to transform some input into some output as in Figure 6.2. Connectivity requires that each entity must be logically dependent on other verbs or activities, and flows of information are needed where for example after ensuring that provision of a particular ferry service is possible, if sufficient demand exists, then operate to meet it.

Systems must also have purposes or objectives, and measures of how successfully they are performing in meeting the system objectives can be defined. Monitoring of these measures then enables the decision taker to apply procedures to take control through a range of control mechanisms. However, operational management decisions only have authority within the boundaries of the particular system to which they are applied, and also require resources in order to be effective.

Figure 6.3 outlines a soft-systems methodology, after Wilson (1990). The 'rich picture' of Figure 6.1 is an initial attempt to structure a complex reality, noting some of the key issues and concerns and their inter-relationships. In the process of stepping into the abstract systems world, each major issue in the rich picture is redefined in terms of relevant systems, by means of a root definition. The root definition, embedded within the context of a problem, represents a system for transforming an expression of concern about a situation into a set of suggestions for lessening the intensity of the concern. Each viewpoint involves a different root definition, which in effect defines what the system is from a particular point of view.

INPUT → TRANSFORMATION PROCESS → OUTPUT

A sea movement system

Demand for movement of people and goods by sea → A system enabling movement by sea → Demand for movement satisfied

An educational system

Demand for personal development → A system enabling personal development to occur → Demand for personal development satisfied

Figure 6.2 A definition of systems enabling sea-movement and education to occur

Soft systems and training in the ferry industry

Whilst remaining in the abstract systems world, the next step involves defining the conceptual systems model as a view of what exists, and it details the set of activities which the system must perform in order to function as the system which has been defined. The conceptual model should be as succinct as possible, containing only that set of activities which are needed to define the system which was outlined in the root definition (e.g. Fig. 6.4). At deeper levels of analysis, new root definitions will allow the inclusion of more detailed activities at a higher level of resolution (e.g. Fig. 6.7). Where a hierarchy of model development is defined, ferry systems would form part of a wider set of international transport systems, in turn divisible into operating and other subsystems. Re-emergence into reality enables comparison of steps 2 and 4, and following discussion of which changes are feasible and desirable, improvements can be implemented at Step 7.

In order to apply this methodology to the problem in hand, the role of the root definition needs to be further refined. In particular, the worldview or outlook determines what one individual sees of the system, and must be included in the root definition. Viewpoints in this context might include the owners of a provider of ferry services, the managers of ferry services, employees, passengers or clients, competitors, ferry designers, legislators, accountants and others. When the viewpoint has been identified, a root definition can be formulated.

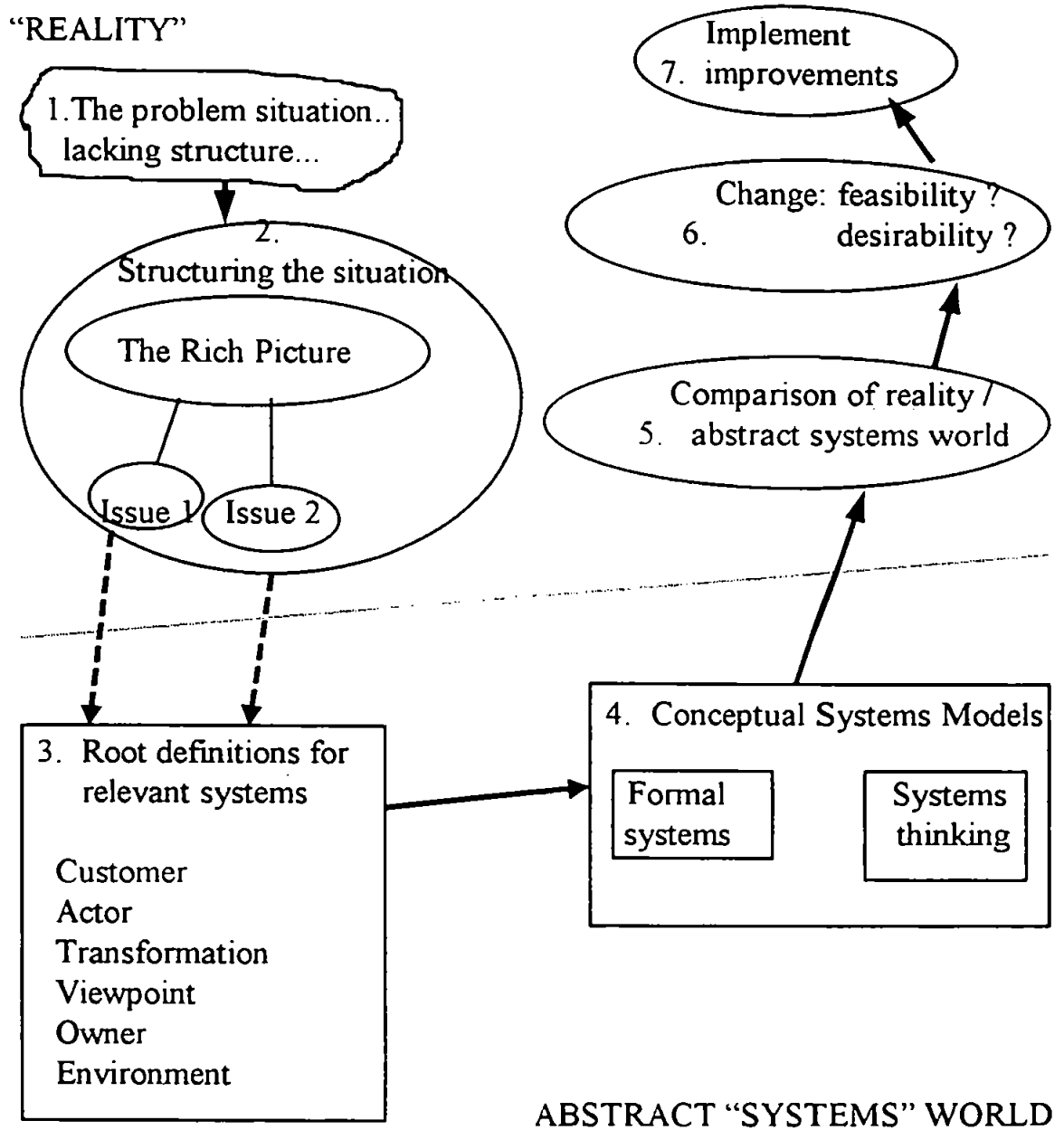


Figure 6.3 The soft systems methodology

A root definition of a provider of ferry services from its owner's viewpoint, hence defining the basic content of the educational provision for managers of services, might be:

“a system to generate profit by safely meeting the demand by passengers and freight forwarders for the movement of goods and people by sea within the constraints imposed by the competitive, technical and legal environment”.

An iterative process of refining root definitions may be required, as the CATWOE test is applied to them. Root definitions may include the following elements:

Customer - the subsystem, for example the client, affected by the main activity. In this case, the passengers and freight forwarders who use ferry services.

Actor - the agents who execute, or cause the transformation process(es) to be carried out as activities of the system. In this case, these include the travel operators, or supply chain processes which generate demand for ferry services, and ferry company employees.

Transformation - the process executed by the system. In this case, the physical movement of goods and people, profitably, safely and to a high standard of operation.

World-view - the perspective which makes this particular root definition meaningful, such as the owners of the provider of ferry services.

Ownership - the system which controls or holds an interest in the process, such as the shareholders of the company.

Environmental constraints. In this case, legislative, financial and technical requirements, public concern for safe operation and competing providers of ferry and other transport services.

Before implementing these systems, analysis at the next lower level relating to ensuring the provision of crew, may raise other issues. Although these may include the educational needs of managers, pay, availability, contractual issues and the like, we move directly to a third level analysis of training and education provision, where a rich picture is presented in Figure 6.5. This is developed into a root definition and CSM from the owners stance in Figure 6.6.

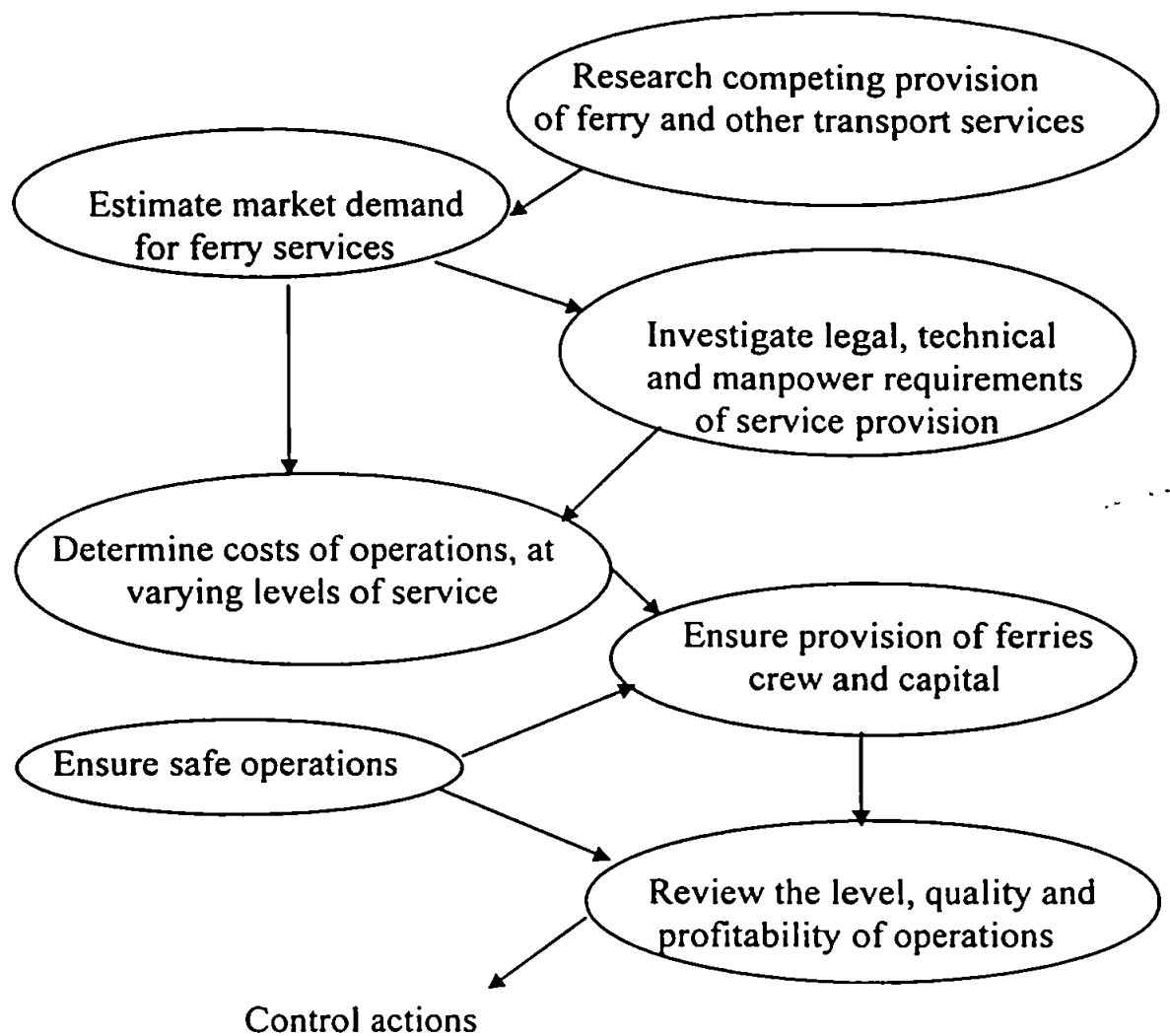


Figure 6.4 A hypothetical conceptual systems model of the business roles, and hence educational content needs, of managers of ferry services, as viewed by owners

DECK OFFICERS.....

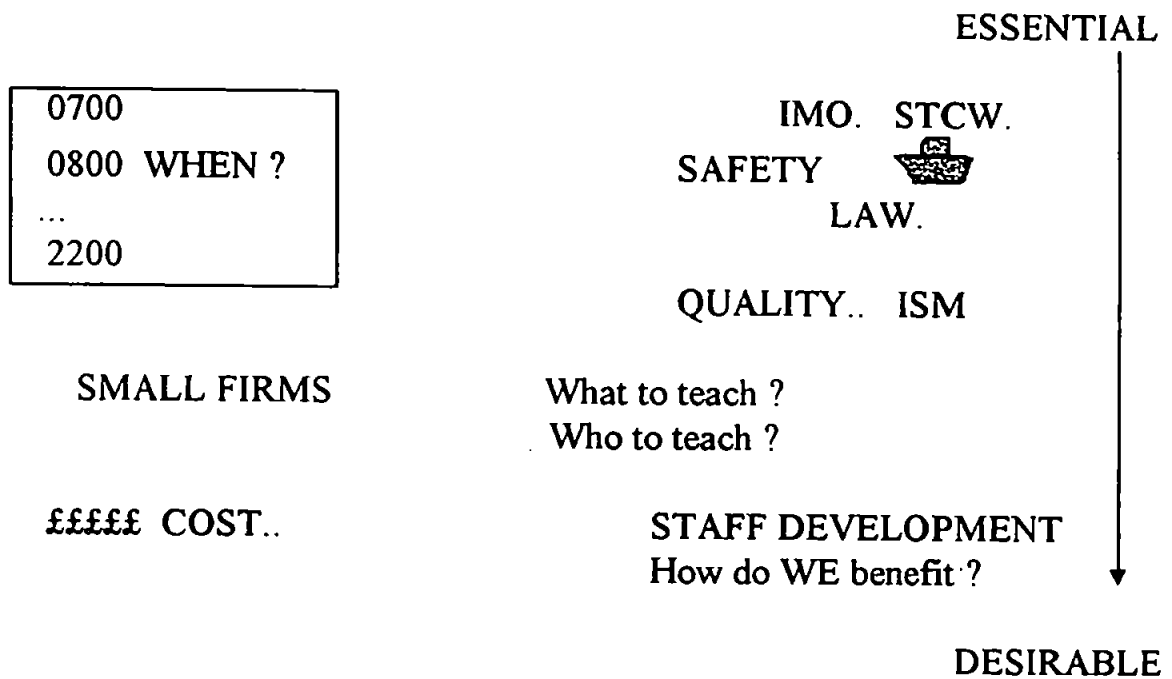


Figure 6.5 A rich picture of current training and education provision in the ferry industry

A root definition of current education for managers of ferry services might be:

“a system to meet the need to develop the knowledge, social awareness and technical skills of managers of ferry services within the constraints imposed by the operating environment”.

A root definition of training for managers of ferry services might be:

“a system to ensure that managers possess the knowledge and technical skills required to operate vessels which move people and goods by sea profitably and safely”.

Root definitions from the owners’ point of view may include the following elements:

Customer - the managers of ferry services: deck and engineering operations, marketing, design and other experts.

Actor - companies who pay for training, centres which assess staff needs, institutions which commission, deliver or assess the educational process.

Transformation - the educational process involving changes in knowledge, social awareness and technical skills of managers.

World-view - the individual recipient of education.

Ownership - regulatory, awarding and accrediting bodies.

Environmental constraints. Legal status of qualifications, time and resources available for funding studies, staffing and operating schedules.

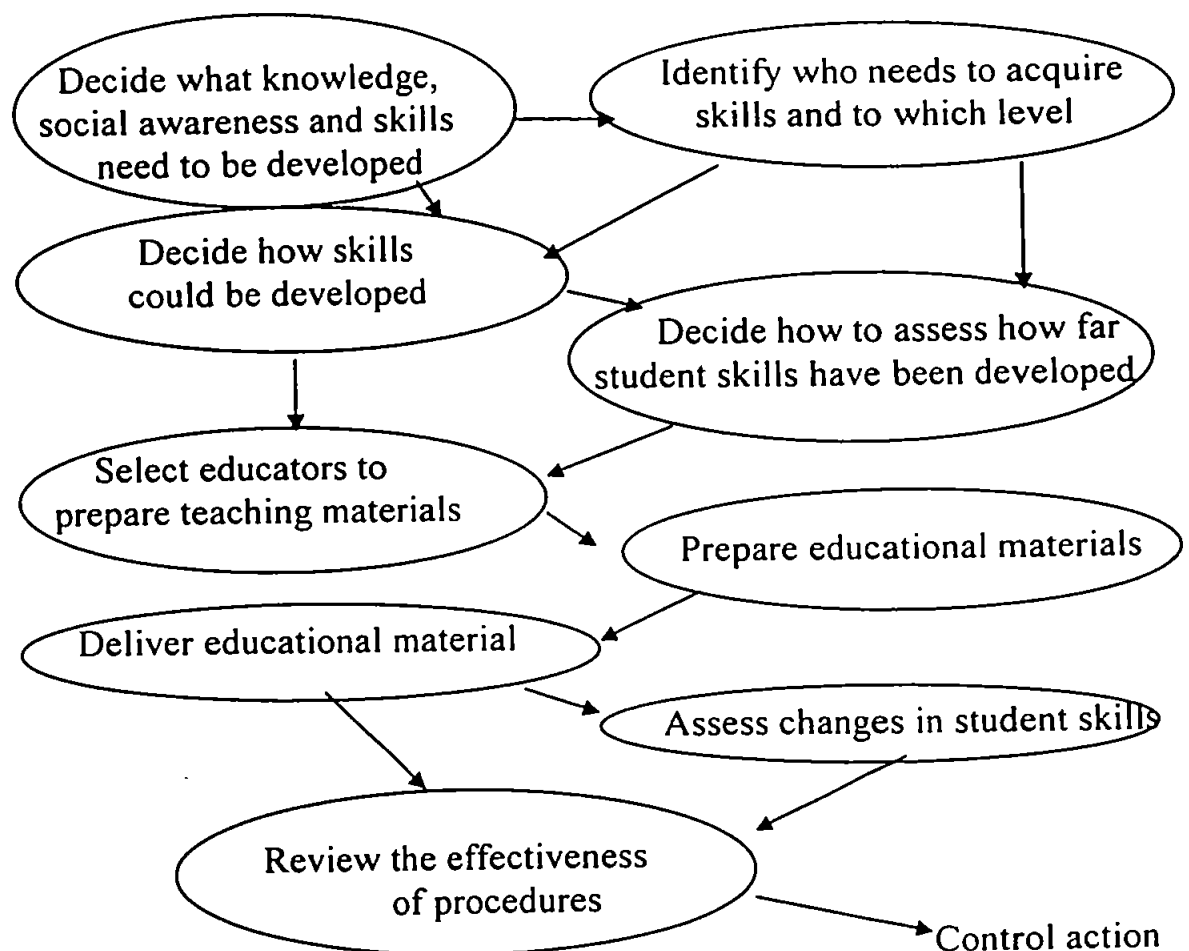


Figure 6.6 A conceptual systems model of the system of educational provision for managers of ferry services

Knowledge, social awareness and skills needs

Cognitive educational requirements of managers of ferry services, outlined in Figures 6.1 and 6.4, can be addressed in the classroom. A critical in-depth appreciation of competing services is unlikely to be gleaned in the workplace (Heijveld and Gray, 1996), and extensive study is required to appreciate the role of new techniques for estimating passenger demand in a price and time sensitive market, possibly involving computer based interviews, which combine for example Stated and Revealed Preference approaches with attitudinal data (Polak and Jones, 1997). In similar vein, understanding of the potential for applying techniques used in planning the maritime transport of people in urban areas (Musso and Migliaro, 1995) and its environmental impacts (Benvenuto *et al*, 1996) to high speed ferry operations requires classroom study. Human relations issues also need updating in this area (McConville, 1996). Intense academic study of costing, safety, legal and technical issues is also more effective in the classroom, and once acquired should be updated regularly for practitioners. Cognitive knowledge is best acquired in an academy, but social awareness and other skills may also be proactively developed there.

The importance of providing training which enables individuals to undertake a range of employment roles is increasing, including emphasis on technical skills, customer service and quality, and core skills in literacy, numeracy, communication skills and team-work (IER, 1995). However, although relatively little has been written regarding the problems of introducing change in the maritime world, they were well-voiced historically. Psychological forces resisting change have been catalogued as including "a crisis in occupational identity, a decrease in self-esteem, and a lack of confidence in one's ability to learn and adjust to a new role" (Rosenstein, 1983, p17). The way in which such problems can be addressed, through training, maximum involvement of staff and clear communication of objectives, has been addressed in a wider arena (Strebler *et al*, 1997) which is equally relevant to managers of ferry services.

The choice of learning strategy is probably driven by the theory of personality which the assessing organisation chooses to subscribe to. In a holistic, dynamic view of personality which considers competence to be a measure of what someone can do at a particular point in time, where some aspect may decay in future, or be developed later, experiential, learner-centred and developmental approaches to learning are appropriate. With a static fragmented view of personality, as fulfilling a static role, an 'enduring' view encourages a behavioural, task-centred approach. The ethical issue as to whether change is desirable, in that the affective domain is a Pandora's Box, including elements which are not necessarily desirable, may also be pertinent.

As one analytical approach to designing course content, error analysis investigates what a competent practitioner should avoid doing (Rowntree, 1981). However, within a context of limited concern for training of ferry operations staff, it may not foster the positive attitudes needed to develop their competencies. Prew (1998) considered that attitude, even on a highly technical bridge resource management training programme was an essential ingredient in providing effective operations management training. This reasoning stems from recognition that some 57% of US air accidents arose due to crew resource management and human factor errors, rising to over 70% in the Swedish maritime authority attributable to bad management, falling asleep and lack of communication. Appreciation of the need for teamwork, and willingness to change behaviour were essential, involving changing attitudes rather than skills. In particular, issues of delegation, working relationships between crew members and changes of watch proved crucial, with a need to concentrate on such areas as communication skills, management style and assertiveness. Although the ISM code requires that human factors be incorporated more into training procedures, such courses of a few days duration are surely less effective than longer periods spent in a well managed university classroom which affords greater scope for reinforcement and monitoring of any behavioural changes.

In terms of learning strategies which may be adopted to develop the affective domain, many approaches are likely to involve long term commitments. The relationships between members of small groups are important, but when replicated in several such groups, they may be feasible for use with larger classes. In behavioural terms, outward compliance may

not be matched by inward change, and cognitive dissonance may occur where perceived external threats such as strong peer pressure could cause an individual to act contrary to his beliefs, to reduce the dissonance. A less threatening academic environment, outwith the workplace, may encourage more genuine changes in an individual. One means of encouraging change involves positive enhancing of curiosity and exploratory behaviour, possibly via discovery learning.

Effective presentation of material aids in achieving low level affective objectives, such as receiving and attending, in turn stimulating satisfaction from the act of responding. However, it may take years to achieve higher level affective objectives, with emphasis and reinforcement needed, via a successive looping through simple and overt skills moving into internalisation until a complex set of consistent and internalised behaviours develops.

Group discussion can be effective in forming an intellectual commitment to change, eventually resulting in actual change (Bloom, 1964). For a major reorganisation of actual practise and responses to occur, the individual must be able to examine his own feelings and attitudes on the subject, compare them with those of others, and move from an intellectual awareness to an actual commitment to a new practice. Learning experiences must be two-way, within a liberal environment in which new experiences are encouraged, which in turn generate complex new learning objectives.

In higher education, project work is one means of addressing affective objectives. Jankowicz (1991) defined a role as "set of expectations of the behaviour which is felt to be appropriate for a person in any social position". Skills developed during project work which prepare students to take on a particular role include managing time during the project, managing perceptions, working under supervision and agreeing confidentiality. The objectives of a project relate to personal learning experiences in helping students to deal and feel comfortable with senior managers, persuading people to cooperate with them, providing assurances of confidentiality arrangements and working with a team of people, usually in a colleague relationship. It may also provide experience of personal pressures of coping with uncertainty about the approach adopted, academic credibility and data, and tensions relating to time management.

Hirsch (1988) identified a number of ways in which skill languages can be developed. Job movement, in a planned fashion, is the main method in which managerial competencies in the workplace can be developed.

However, regular appraisal and feedback interviews are also seen as an essential input. Particularly within a small business environment, there is a role for assessment centres and management development centres, which can discuss people and jobs across organisational boundaries.

Identify who needs to acquire skills and at what level

In recent years there has been limited interest in human resources management issues, where for example in 'Cruise and Ferry 1995' (Brogren, 1995) marketing, competitive, design, operating and financing issues were paramount but personnel issues were relegated to discussion alongside developments in safety management. Nordstrom (1995) noted that human factors cause around 70% of all accidents at sea, but that where hundreds of passenger lives may be affected, media interest is intense. The need for education, training, motivation and organisation is great, with training being vital to an ability to handle emergency abandon ship and fire drills, groundings, and collisions, and the importance of education is acknowledged, but never specified in detail. Where Masters and Engineers are responsible to the Managing Director directly, with no middleman personnel function in a ship operation system, it is essential that they all receive some education in human resources issues, if human errors are to be minimised.

Current training resources are not necessarily well-targeted with young, highly educated employees, in white collar occupations in larger firms being most likely to receive more training, when arguably they are the one in least need of it (IER, 1995). Successful implementation of ISM codes (Ward, 1995) requires personnel to be trained at all levels. Senior managers need to be prepared to manage the process of change, while still reflecting the culture and character of the company, and being committed to the process. Care must be taken when appointing and training 'Designated Persons' to take responsibility for implementing the code. The code can be no better than the sum of its parts, so care must be taken to invest in detail at each stage if it is to be effective.

Corse (1995) fully articulated the role of personnel issues when implementing ISM codes. In the process, management must be capable and committed, and seafarers must be competent. Masters must be given adequate instruction, guidance and support, and effective communication is required through a common language. All stakeholders, including owners,

passengers, crew, Flag State, Coastal State and the public at large are involved. Each element could be viewed in systems terms, with a need for defining responsibilities and objectives, and receiving regular monitoring and feedback.

How to identify the need for training

Initiatives to encourage training programmes in organisations are well developed, based on for example the Investing in People initiative (Turnbull, 1996). Increased staff motivation may well result in increased success and hence profit, but the benefits of the scheme must be communicated to, and understood by, employees at all levels. To be accepted and effective, training must fit in with the Business Plan and organisational mission statements, which should identify any skills gaps which need to be addressed. At the individual level, an appraisal should identify the development needs of individuals, and agree on an action plan for achieving it (Fletcher, 1997).

In identifying training needs, managers need to first assess the requirements of the job, through a job analysis, and match these with the analysis of the individual, to identify any training gap (e.g. Weightman, 1994, p53). In terms of a job analysis, this may relate either to the complete range of skills and understanding needed to do the job, or a particular part of it. Individual analysis may include self-assessment, assessment by experts, or a performance appraisal system, possibly using a grid of competencies appropriate to the job against which each individual can be assessed.

Decide how to assess how far skills have been developed

Employers need to be assured that values and attitudes acquired in the classroom will still be present in the workplace, but in assessing the degree of competence attained in affective skills, where each individual may need to define their own goals, there is a danger of being over-deterministic where value sets are individually defined. Even if objectives, learning strategies and assessment issues can be agreed, there may be less agreement regarding the range of situations over which these attitudes should apply.

The ability of a student to make certain statements in a traditional examination may be insufficient evidence of the attainment of particular

levels of development. Where objectivity is unlikely, more emphasis on viva voce assessments, seminars, practicals and fieldwork may be appropriate.

In attempting to assess levels of management competencies CNAABTEC (1990) noted the importance of reflecting on experiences. Portfolios of applied work-based exercises encouraged candidates to take responsibility for their own learning, recording their experiences gained in projects, assignments, simulations, case-studies, group and residential work. For operationally active managers of ferry services, programmes using distance learning materials, video-conferencing and learning contracts may be effective. However in any work-based learning, the support and guidance of a mentor can both help to develop attitudes, presentation skills, and good management practice, and provide a source of resources and advice.

Select educators and prepare educational materials

Two issues have been combined here, in that once selected, educators are also likely to prepare their own materials. Exceptions may occur where a larger organisation has chosen to develop courses in house, using its own staff where possible but is lacking in specialist materials, or where technical materials representing industry standards such as simulation approaches are widely available to all educators. Unless materials are well presented, basic affective objectives of receiving and attention are unlikely to be attained. Repetition and reinforcement of not only materials, but also a consistent set of values is vital, in different stages and components of a course. Material should be discussed, if it is to be internalised, raising the need for role plays, simulations and the like in developing and assessing values in the classroom. To develop competence skills in the workplace, where learning through experience is important, the use of mentors, portfolios and constant discussion of familiar issues within the context of new job placements can aid development. Contexts such as 'acting up', where an individual may temporarily cover for a superior; job rotation, where work is varied over a period of time and on the job training increase the realism of the experience.

Deliver educational materials

The mode of delivering educational materials will depend on the learning objectives, strategy and nature of the materials involved. However, particularly for managers of ferry services, who have severe constraints on

their time available for study, it is essential that unless they are able to leave the workplace to return to academic environments for extended periods of time, flexible learning methods are available. For seafarers working at variable times of day and week, or at variable locations, distance learning materials delivered by video-conferencing or via individually based remote learning packages may be the only form of contact available. In terms of tailoring training programmes to individual development needs, assessment centres or other methods of defining programmes to the needs of individuals and establishing appropriate learning contracts may be necessary. Once priorities have been established, short courses or other periods of intense development away from the workplace may be most effective in encouraging major behavioural changes.

Assess changes in student skills

When assessing competencies outwith the workplace, the times and places within which assessments are framed must still be capable of yielding appropriate and reliable statements about an individual's skills in the workplace. Where the skills of managers form an integrated and complex whole, it may be inappropriate to present them as disaggregated, explicit and measurable components, but Bloom (1964) attempted to show how each affective objective could be identified. When testing for awareness, where any hint from an examiner alerts the student to the phenomenon in question, assessment might request students to rank alternative courses of action in a particular situation in terms of their desirability, or use multiple response approaches. Willingness and selected attention are apparent in a like or dislike of certain activities. Willingness to invest in non-mandatory personal development materials and activities may be one measure of acquiescence in responding, while attention to presentation or performing additional duties may signify a willingness to respond. Whether the reason for willingness is genuine interest, or simply a desire to please an assessor is immaterial, but adjectives used by students to describe their experiences may indicate their satisfaction in response.

'Valuing' includes acceptance, preference and commitment. The extent to which a person agrees with a series of statements relating to for example pollution reduction may indicate acceptance, while taking overt action such as attending meetings, signifies preference. At the commitment level, without being asked, a student may say why he considers some phenomenon

to be desirable. Valuing is prolonged, energy is invested in the phenomenon, and actions are manifested in it, as might be apparent in a role-play, or when students attempt to transmit their values to their peers.

Adults should display an organised set of values, where the conceptualisation of value is via cognitive processes of abstraction and generalisation. A desire to compare the work of individuals, or attempt to determine the universal characteristics of good practice might be present, where cognitive skills operate at a value laden level. Organisation of a value system not only involves placing values within the context of concepts, but via synthesis may generate new or higher order values. Testing for this involves isolating the components of the value system, and then observing patterns which link them. Role plays of workplace contexts, where students may enact varying racial roles within personnel contexts of hiring, firing and disciplinary actions might provide situations where stereotypical behaviour could be observed, away from the workplace.

A generalised set of attitudes might be apparent from the way in which a student tackled a problem: with care, objectivity and confidence for example. Examiners outside of the workplace may have formed different judgements about value sets which are desirable, and could provide corroborative evidence of how far an individual's profile coincides with these. Characterisation involves a consistent philosophy of life, based on consideration of others, greatest good for the greatest numbers and similar tenets, which have been modified and rationalised by conscious assessment of their human significance, and should be equally apparent in the workplace and classroom. The classroom can also provide useful laboratory contexts, such as where Jankowicz (1991) discussed the personal relationships on which students may be assessed in project work. Where students knew that the people they were reporting to would also be assessing them, it was important to maintain the relationship, since lack of contact, would also downgrade their cognitively assessed work.

Review the effectiveness

In assessing management competence, application skills are being tested and are predicated by sound knowledge and understanding, which is being put to use. Classroom based oral or written examinations may draw on work experiences, but much of the evidence is only apparent in real work situations. Many professional bodies not only reserve membership for those

who have demonstrated sustained management competence and skills, but insist on continuing professional development programmes to maintain the a fully rounded, complete manager.

Conclusion

In a dynamic business environment, managers of ferry services must proactively develop their skills and competencies. Although learning derived from past accidents provides one source of information, the complexity of recent technical developments may necessitate periods of academic learning to maintain high level cognitive knowledge and understanding. By providing an independent and supportive environment away from the workplace, the classroom may also be the most appropriate place in which affective and behavioural change can be fostered, although ongoing nurturing of these skills on return to the workplace is essential. Interest in human resources issues in shipping, despite being subsumed in recent years, again needs to come to the fore. A soft systems approach to defining the cognitive training requirements for managers of ferry services highlighted these, along with forecasting, marketing and market research skills, costing and investment appraisal methods, and understanding of recent developments in legislation, safety and design to be the major areas of general interest. Emphasis on particular areas will depend on the individual manager's role and organisational needs.

Probably of even greater importance, the affective and behavioural skills of individuals may need to be developed, with personal characteristics of self-esteem, motivation and responsibility widely considered to be priorities. If basic academic skills can be assumed in managers, then higher order thinking skills enabling individuals to respond to rapid changes, solve problems, think creatively and make good decisions, and 'learning how to learn' are priorities. Most important of all, interpersonal and teamwork skills represent a crucial subset of skills which can be developed effectively in the classroom. Although precise definitions of skills may vary, negotiation and conflict resolution skills, leadership and an ability to work with others from diverse backgrounds are common areas for personal development.

Employers are attracted to training programmes because they value the benefits of increasing flexibility, and raising of customer awareness and

responsiveness to future changes in demand which may result. Most employees and employers already accept that training is a good thing, but they need to be convinced personally of the benefits of this approach. However, small firms fear the cost of training and potential loss of skilled employees, and individuals are most influenced by their previous success or lack of it, and domestic considerations (IER, 1995).

Training needs to be made available flexibly to suit the requirements of both individuals and organisations. In particular, given the operational schedules of managers, distance learning packages may be appropriate. A range of assessment centres, operated either by large organisations in-house, or independently providing a service which can be made available to individuals or small businesses on demand, are needed. At these centres, the existing levels of individual competencies can be assessed, against a broader set of industrial or organisational standards, enabling their training needs to be defined. Programmes of training could be established, which may include periods of attendance at academic establishments, away from the workplace, or the negotiation of learning contracts which could be enacted with the aid of a mentor in the workplace. In either event, it is unlikely that traditional lectures and examinations will provide the most effective learning and assessment strategies, with broader approaches to both required, as discussed above. Assessment should be based on performance skills rather than personality tests, and will involve all parties, including the individual who is being developed. Grading at other than pass/fail is inappropriate, with profiles and records of achievement being maintained over extended periods of time to record progress. Regular discussion of what constitutes good practice is also an important part of the development process.

The individual provides the starting point, and by analysing their own self goals, it should be possible to instil the process of self criticism and evaluation into a personal achievement programme. Assessment at the end of a course could address the following issues:

- Management of self. How did you cope with meeting work deadlines? How did you cope with the uncertainty over whether your work was acceptable?
- Group relationships. What was your role in groupworks during the course, and how did it change or develop? Describe how you got on with other students and contacts you made during your project work.

- Values at work. Give examples from your own experience of how you displayed confidentiality and loyalty.

The student would then be asked to mark each component and make any additional comments. Their award would be conditional on a satisfactory level of self awareness.

References

- Andrew Davies, J. (1968), "Education - an overall view", in D.H.Moreby (ed), *Personnel Management in Merchant Ships*, Pergamon Press, London, pp. 131-145
- Ashton, D.N. and Green, F. (1996), *Education, Training and the Global Economy*, Edward Elgar Publishing, Cheltenham, UK.
- Benvenuto, G., Figari, M., Migliaro, C. and Rossi, E. (1996), "Environmental impacts of land and maritime transports in urban areas", in J.M.Baldasano Recio and L.J.Sucharov (eds), *Urban Transport and the Environment*, II, Computational Mechanics Publications, Southampton, pp. 175-184.
- Bloom, B.S., Englehart, M.D., Furst, E.J., Hill, W.H. and Krathwohl, D.R. (1956), *Taxonomy of Educational Objectives, The Classification of Educational Goals, Handbook 1 : Cognitive Domain*, Longman, London.
- Bloom, B.S., Krathwohl, D.R. and Masia, B.B. (1964), *Taxonomy of Educational Objectives Book 2 Affective Domain*, Longman, London.
- Brennan, J. (1985), *Preparing Students for Employment Studies in Higher Education*, vol. 10, no. 2, pp. 151-162.
- Brogren, K. (1995), "Market Snapshots of the passenger shipping industry", in Conference of Cruise and Ferry 95 - Session 1, *Conference Papers and Speakers Profiles*, vol. 1, BML Business Meetings Ltd, Rickmansworth, Herts, UK, 10pp.
- Business and Technician Education Council (1984), *Policies and Priorities into the 1990's BTEC*, London.
- Carter, R. (1985), *A Taxonomy of Objectives for Professional Education. Studies in Higher Education*, vol. 10, no. 2, pp. 135-149.
- CNAABTEC (1990), *The Assessment of Management Competencies*, The Employment Department (Training).
- Corse, J. (1995), "An alternative view on the ISM code and the safety culture", in Conference of Cruise and Ferry 95 - Session 14, *Conference Papers and Speakers Profiles*, vol. 2, BML Business Meetings Ltd, Rickmansworth, Herts, UK, 7pp.
- Cruise and Ferry 95 (1995), *Conference Papers and Speakers Profiles*, volumes 1, 1A and 2, BML Business Meetings Ltd, Rickmansworth, Herts, UK.

- DETR (1997), "Table 6.6. Roll-on/roll-off ferry traffic: road goods vehicles outward to mainland Europe, 1986-1996", *Transport Statistics*, Department of the Environment, Transport and the Regions, Scottish Office Education and Industry Department, Welsh Office, The Stationary Office, London, p. 111.
- Dinwoodie, J. (1988), "Chapter 6: Cross channel shipping", in J.Dinwoodie, *Shipping Operational Research in Hard Cases or Soft*, Working paper number 17, Department of Shipping and Transport, Plymouth Polytechnic, Plymouth, 8pp.
- Dinwoodie, J. (1997), "The role of a peer-assessed quantitative case-study in developing professional skills more effectively in a maritime business classroom", in O.K.Sag, (ed), *Proceedings of the Eighth Congress of the International Maritime Association of the Mediterranean. Volume 3, Istanbul, Turkey*, Istanbul Technical University Maritime Faculty, Istanbul, Turkey. pp. 18.1.36 - 18.1.45.
- Evangelista, P. and Morvillo, A. (1998), "The role of training in developing entrepreneurship: the case of shipping in Italy", *Maritime Policy and Management*, vol. 25, no. 1, pp. 81-96.
- Fletcher, C. (1997), *Appraisal: Routes to Improved Performance*, 2nd edition, Institute of Personnel and Development, London.
- Guy, M.E. (1990), *Ethical decision making in everyday work situations*, Quorum.
- Heijveld, H. and Gray, R. (1996), "The competitive environment of a service industry: the example of the U.K.-Continent passenger sea ferry services", *Maritime Policy and Management*, vol. 23, no. 2, pp. 157-166.
- Hirsch, W. and Bevan, S. (1988), *What makes a manager ?*, Institute of Manpower Studies.
- Hynds, P. (1998), "Passengers protected from the elements", *Speed at Sea*, vol. 4, issue 1, February, pp. 65-70.
- IER (1995), *Planning for the 21st Century: a summary of "Labour market and skill trends, 1995/96"*, Institute of Employment Research, Skills and Enterprise Network, Nottingham, U.K. 12 pp.
- James, D. (1998), "Electronic engineers aid high-speed operations", *Speed at Sea*, vol. 4, issue 1, February, pp. 60-62.
- Jankowicz, A.D. (1991), *Business Research Projects for Students*, Chapman and Hall.
- Lane A.D., (1986), *Grey dawn breaking: British Merchant seafarers in the late twentieth century*, Alden Press, Oxford.
- Lloyd's List (1995a), "Forecasters disagree over speed of growth", *Cruise Shipping - Lloyd's List Magazine*, February, p.23
- Lloyd's List (1995b), "Coming to terms with disasters", *Cruise Shipping - Lloyd's List Magazine*, May, p. 28-31.
- McConville, J. (1996), "Editorial: A paucity of information", *Maritime Policy and Management*, vol. 23, no. 2, pp. 99-101.

- Moreby, D.H. (1968), *Personnel Management in Merchant Ships*, Pergamon Press, London.
- Musso, E. and Migliaro, C. (1995), "Maritime transport of people in urban areas", in L.J.Sucharov (ed) *Urban Transport and the Environment for the 21st Century*, Computational Mechanics Publications, Southampton, pp. 37-44.
- Nordstrom, P. (1995), "The human factor in ferry Safety", in Conference of Cruise and Ferry 95 - Session 17, *Conference Papers and Speakers Profiles*, vol. 2, BML Business Meetings Ltd, Rickmansworth, Herts, UK, 5pp.
- Nuttgens, P. (1988), *What shall we teach and how shall we teach it?*, Gower.
- O'Neil, H.F., Allred, K. and Baker, E.L. (1997), "Review of workforce readiness theoretical frameworks", in H.F.O'Neil (ed) *Workforce Readiness: Competencies and Assessment*, Lawrence Erlbaum, New Jersey, pp. 3-27.
- Polak, J. and Jones, P. (1997), "Using stated-preference methods to examine traveller preferences and responses", in P.Stopher and M.Lee-Gosselin (eds), *Understanding Travel Behaviour in an Era of Change*, Elsevier Science, Pergamon, Oxford, pp.177-207.
- Pope, D. (1983), *The objectives model of curriculum planning and evaluation*, CET Occasional Paper 10, Council for Educational Technology for the United Kingdom.
- Prew, S.J. (1998), "A question of attitude", *Speed at Sea*, vol. 3, issue 3, June, Halldale Publishing, Hants, UK, pp. 16-18.
- Rosenstein, E. (1983), "Organisational changes in shipping: Symposium Aims and a review of recent literature", in E.Rosenstein and A.M.Goldstein (eds), *Organisational changes in shipping in Europe and Israel Symposium Proceedings*, Israel Shipping Research Institute, Haifa, pp.1-19.
- Rowntree, D. (1981), *Developing courses for students*, McGraw Hill.
- Sinclair, K.E. (1997), "Work competencies of college graduates", in H.F.O'Neil (ed), *Workforce Readiness: Competencies and Assessment*, Lawrence Erlbaum, New Jersey, pp. 103-120.
- Strebler, M., Robinson, D., and Heron, P. (1997), *Getting the Best Out of Your Competencies*, Institute for Employment Studies, Brighton, UK.
- Turnbull, H. (1996), *Investing in People: How to Achieve Higher Standards and a Competitive Edge at Work*, How to Books Ltd, Plymouth, UK.
- Ward, D. (1995), "Senior Management - their role in the implementation of the ISM Code", in Conference of Cruise and Ferry 95 - Session 14, *Conference Papers and Speakers Profiles*, vol. 2, BML Business Meetings Ltd, Rickmansworth, Herts, UK, 9pp.
- Weightman, J. (1994), *Competencies in Action*, Institute of Personnel and Development, London.
- Wilson, B. (1990), *Systems: Concepts, Applications and Methodologies*, 2nd edition, Wiley, Chichester, UK.

Also see:

Dinwoodie, J. (2000b, Work 4, *op. cit.*), Ch.9, 181-198.

**Attitudes, Education, State Controls and Practitioners in UK
Port Logistics.**

Section F.

**Disseminating findings to promote
recruitment into professions and courses.**

Paper 11

WHY STUDY LOGISTICS?

The complex world of logistics will demand that ever more managers return to advanced courses of study at various points in their careers says John Dinwoodie

The world of logistics represents one of the most dynamic and competitive business environments around. In an increasingly complex and technically integrated supply chain, only those organisations with a human resource base trained to grasp the opportunities offered by technical innovation, and honed in responding effectively to change, will thrive. A workforce with little motivation and enthusiasm, an acute shortage of managerial and technical skills, a conspicuous lack of leadership qualities, and inappropriate attitudes, is unlikely to survive in the long term. Whilst organisations involved in logistics can ensure open and attractive career structures for all grades of their staff, these must also be accompanied by relevant ongoing training or education schemes often involving time spent in the classroom, to motivate and update the skills of individuals.

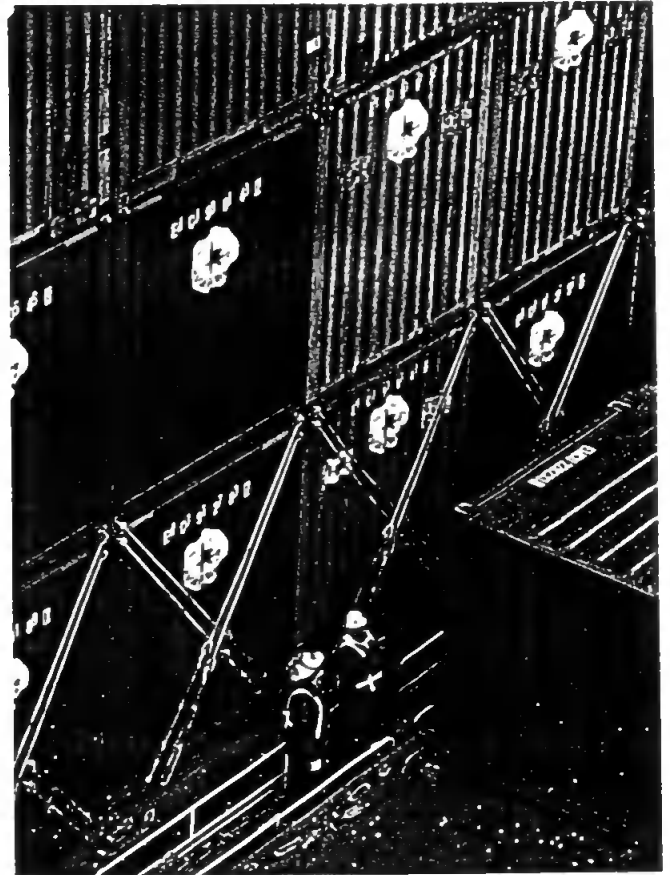
All responsible organisations will be keen to ensure that at least the minimum levels of technical competence are attained through the provision of corporate training schemes for all staff who need to achieve them. However, enduring excellence will also depend on the desire and willingness of individual employees to attain ever higher levels of personal qualifications. As the demand for managers with graduate and postgraduate level qualifications grows, it becomes increasingly important that personnel managers should be able to understand the processes whereby individuals seek to undertake study in logistics. Increasingly, the responsibility for achieving and funding educational qualifications is being shifted onto individual employees, as neither the state nor corporate schemes are able to fund their studies.

Recent surveys conducted amongst postgraduate students in logistics, registered on courses at universities in the UK, have indicated the range of issues which influenced their decision to undertake postgraduate study. Other issues which they raised included such factors as the influence of family and friends, the importance of studying in a particular country or institution, and perceptions of barriers to deciding on taking particular courses of action.

WHY SHOULD LOGISTICS MANAGERS UNDERTAKE POSTGRADUATE STUDY?

Increasingly, marketing strategies are being based on ongoing relational co-operation with other organisations. What better environment is there within which to acquire the survival kit demanded by globalisation in terms of co-operation, integration and information skills, than in a multi-national postgraduate classroom?

Rapid technological advances require managers who are sufficiently knowledgeable regarding the technologies which are available, and also willing to apply them in their



own workplace. Aside from a lack of knowledge of such systems on the part of managers, the major problem in implementing new ideas and methods, is how to motivate executives to undertake to equip their vehicles and plant with new technologies. As the number of managers in an organisation who achieve postgraduate qualifications grows, so should their organisation's success in implementing new technologies.

Traditional issues of status and insecurity which present barriers to implementing new technical and management systems can be sympathetically addressed in the security of the classroom. Education can not only increase employees' familiarity with new ideas, but also their willingness to embrace them.

Resources committed to educating and training should be viewed as representing an investment rather than a cost. In raising staff morale and motivation, as well as nurturing technical competence, such investment may well be the least risk solution to many logistics problems, with a very high rate of return.

Postgraduate courses present an obvious medium for exchanges between, for example, shippers and freight forwarders, and an effective way of establishing both the relationships themselves, and also the learning culture within which relationships develop, set apart from the immediate workplace. This change in attitudes and working practices which is required to cope with or implement change successfully, is just one of the benefits which managers are likely to acquire most efficiently, through partic-

cated that they could not be deterred from undertaking study, issues of funding, offers of employment and being sure of undertaking the right course, would have constituted their main deterrents. For some mature logistics students, personal recommendations from previous lecturers were critical to their choice of course, but talking to former students and reading brochures were also significant sources of information about courses which were available. For overseas students, the desire to practise the English language, or just

important as financial considerations in preventing a potential barrier forming to deter them from undertaking postgraduate study.

What kind of person undertakes postgraduate study in logistics? In relation to the research conducted, overall, over 20 per cent of students surveyed were female, with around 15 per cent aged over 30 years. Students on courses were frequently drawn from all the major continents, although European students predominated on some courses. About one third of all students

With trends towards life-long learning, it is highly likely that managers of the future will need to return regularly to the classroom, throughout their working lives

icipating in postgraduate courses. The motivation of managers, and their ability and willingness to respond to customer needs, can also be enhanced following time spent in the classroom reflecting on their existing working experiences.

For the individual, the pressures are different. With trends towards life-long learning, it is highly likely that managers of the future will need to return regularly to the classroom, throughout their working lives. As they near the end of each course, they again tend to place increasing importance on the role of their employment prospects once they have completed their course.

In surveys of postgraduate logistics students, family circumstances were often not the deciding factor, although many students claimed that they had had an influence, to the extent that funding was critical for 17 per cent of them. Many students had undertaken postgraduate study in order to 'broaden their knowledge', or 'learn new things', but employment issues, and wanting to specialise, were equally important. Although concerns with finding suitable employment were critical to more of the students who had limited work experience, this was not so where 'subject interest' predominated for many of the mature students with extensive work experience.

Although one third of students indi-

to go abroad, was important, but holding a recognised qualification and gaining experience of business traditions were also important.

Although insistence on study at a particular university was rarely considered to be critical by students, the notion of course specialisms were an important issue in deciding which university to study at. Reputations of the lecturers, or the course, were important to some students, but although the image of the city in which their university was based was often positive, this factor was less important than course considerations. The possibility of progression to more advanced courses, such as progressing onto Masters degrees from Diploma courses, was also important for many logistics students. Ratings of university courses in relation to other courses, and the recognition of courses afforded by employers, were also significant issues in choosing which particular courses and university to attend.

A retrospective unwillingness by many students to consider alternative academic courses may reflect a desire to justify having made a particular decision, rather than reflecting their actual thoughts at the time when the decision was being made. However, issues of course duration, cost and emphasis were also significant factors to them. Particularly for more mature students, being made to feel welcome was just as

reported no significant work experience, but over half had worked full time, and 20 per cent had worked for at least 3 years, in areas of work relevant to their course.

CONCLUSION

The complex world of logistics will demand that ever more managers return to advanced courses of study at various points in their careers. Such courses represent an opportunity for individuals to update not only their technical and technological skills, but also to form new business relationships, and renew their outlook on how they conduct themselves and their affairs in business. Time spent in the classroom is possibly the single investment with the highest return which an individual can make, giving rich returns both to them personally, and also to the organisations which employ them. However, if individuals and organisations fail to ensure that they are investing sufficiently in this area, they are very unlikely to survive and prosper in the long term. 

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Also see:

Dinwoodie, J. (2000b, Work 4, *op. cit.*), Ch.8, 169-180.

**A National Comparison of the Perceptions of Undergraduates
and Postgraduates**

Appendix.

Other recent refereed publications by

J. Dinwoodie

Van Schijndel, W.J. and Dinwoodie, J., (2000), Congestion and Multimodal Transport: A survey of Cargo Transport Operators in the Netherlands, *Transport Policy*, 7(4), 231-241. ISSN 0967 070X.

Weber, M. and Dinwoodie, J., (2000), Fifth freedoms and airline alliances. The role of fifth freedom traffic in an understanding of airline alliances. *Journal of Air Transport Management*, 6(1), 51-60, ISSN 0969-6997.