

# Lecturers' Attitudes towards New Teaching Methods

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## Abstract

Two hundred and thirty-one lecturers in a UK university completed a questionnaire concerning their utilisation of and attitudes towards new teaching methods involving student groupwork and/or information technology (IT). Discriminant functions were computed to identify the variables that significantly differentiated between (i) users and non-users of IT-led teaching techniques and (ii) lecturers who did and did not employ group-work extensively. The coefficients of these discriminant functions were then used to categorise in these respects a holdout sample of 65 lecturers drawn from other universities. A regression analysis was completed in an attempt to explain the degrees to which the lecturers in both samples (a) were favourably inclined towards new teaching methods and technologies, (b) disseminated to colleagues their knowledge about new methods and (c) wanted to learn more about relevant matters. The investigation also explored respondents' perceptions of the main barriers to and motivators of lecturers' adoption of new teaching technologies and methods, the sources of information and advice to which people turned for help with problems arising from the application of new methods and the problem of 'information dependence'.

Key words: Teaching methods, knowledge acquisition, groupwork, IT-based teaching and learning, information dependence.

## Introduction

In 1989 the British government began systematically to reduce the unit of resource available to higher education (SSES 1991). Class sizes rose, young people from a wide range of educational backgrounds began to enter universities and mixed ability teaching became increasingly common. By 1999 the money spent on each student was barely 60% of its 1989 level (CESC 2001; Thomson 2001). Coping with this new situation required fresh thinking *vis-à-vis* modes of delivery of instructional materials and novel approaches to the management of very large classes. Teacher trainers and others responsible for educational staff development in universities started to:

- (i) advocate a plethora of techniques designed to enable lecturers to handle 100-plus classes for long durations, typically involving mid-lecture activities which enable sessions to be stopped for a period to implement interesting activities – see Smith 1997); and
- (ii) encourage the transmission of information to students using information technology (IT) based methods. Concomitantly,

students were required to become “independent learners”: i.e. to assume responsibility for their own learning, to use intranet-based instructional materials and to learn collectively in group situations.

Institutional demands on lecturers to employ IT-led teaching methods and apply student-centred independent learning led in turn to corresponding pressures on lecturers to acquire the skills required to utilise these methods effectively. Thus, the individual teacher might have been expected to learn how to prepare PowerPoint presentations; how to put materials onto a university's intranet; how to set up a Webpage; communicate with students on-line; use an electronic blackboard; employ computer software to mark multiple choice tests automatically and so on. Equally, the lecturer may have needed to become familiar with new techniques of groupwork management. This could have required becoming acquainted with, for example, “pyramiding” - whereby one student considers a problem, discusses it with another student, then with a third, etc.; “cross-overs” - the systematic swapping of students between groups; “fishbowls” - having a small group physically surrounded by a larger one which listens carefully to and reports on the

inner-group's deliberations and so on. But how *in practice* have university lecturers obtained these skills? Institutions had to find the resources for staff development of this nature from their existing budgets; state assistance was sparse, especially in relation to training lecturers to use computers as a learning resource - see Eley and Eley 1995.

So far as IT has been concerned, a survey conducted by Hammond (1992) found that university lecturers consistently cited lack of training as a major factor discouraging them from using computers in the course of their teaching duties. Eley and Eley (1995) similarly noted several studies which concluded that very few universities had actually instituted staff development programmes to ensure there was sufficient expertise in IT among lecturing staff. This paucity of training, they suggested, had significantly inhibited the use of computers in university teaching and meant that "... IT in teaching remains largely a matter of individual initiative" (24). Even the UK government's Technology in Learning and Teaching Project (TLTP) did not normally include money for staff development in the employment of IT. Resistance to change on the part of lecturers might also have acted as a barrier to the introduction of new instructional techniques and not just those related to IT. The imposition of new methods by institutions may have been seen by lecturers as ill-considered and "... the fears and apprehensions of those on the receiving end could indeed have been well-founded in relation to their own interests and values" (Painter 1996, 64). Meyer and Goes' (1988) study of the assimilation of medical innovations defined as "significant departures from previous techniques" (903) concluded that responses to change depended as much on the *contexts* through which radical innovations were introduced as on the technical aspects of new methods. Inappropriate contexts might arouse perceptions of damage to the self-interest of individuals and groups who fear that changes may encroach on their territory and challenge existing practices. Yaverbaum's (1998) study of commercial managers who had been compelled to use computers found that managers who utilised computers did not find their jobs any more significant, interesting or meaningful than the average manager. Thus,

work redesign and other contextual matters were essential for the effective implementation of new techniques.

This paper is about the ways in which university lecturers *actually* acquire know-how about new teaching technologies and methods, focusing on the degrees to which people rely on informal contacts with colleagues rather than on central university teaching support services. It examines the potential problem of "information dependence" whereby lecturers can pick up bad practices from unqualified workmates and it assesses the factors that cause lecturers to be favourably inclined towards new approaches. These issues are important because universities need to know how best to support their academic staff *vis-à-vis* the acquisition of knowledge about new teaching methods. Research in the area allows constraints on the effective implementation of new methods to be identified and the quality of teaching and learning within universities to be improved. So far as IT is concerned, moreover, there is evidence to suggest that teachers' opinions of the usefulness of computer-driven methods help explain students' attitudes towards these methods, including the dissemination of 'computer phobia' (see Morgan *et al.* 2000). It is vital, therefore, that the factors possibly underlying negative views on such matters be investigated in depth. Lecturers as well as staff developers should be interested in the outcomes to this study, as the results highlight certain difficulties they might experience in consequence of relying too heavily on immediate workplace colleagues for help and advice with the application of new methods. Also, the conclusions emphasise the potential benefits to the individual lecturer that can accrue from certain forms of training.

### **Aims of this study**

This was a purely exploratory study in an area where directly pertinent previous research has been limited. Thus, it sought to identify relevant variables, to explore key inter-relationships among them and hence to lay down a framework for future more rigorous investigation. Accordingly, the research employed a number of constructs drawn from and validated in fields other than educational research, plus certain *ad hoc* measures suggested by contiguous academic literature

in order to examine various questions. Two hundred and ninety-six university lecturers participated in the investigation, which proceeded *via* a questionnaire distributed in Spring 2001. The first issue to be explored concerned the ways by which lecturers obtained help and advice with unfamiliar teaching techniques and technologies. Individual lecturers may acquire know-how about new methods through formal or informal channels. The former could include post-graduate teacher training programmes, short courses or institution-based skill-specific workshops. However, most lecturers in UK universities began their careers when teacher training was not obligatory and it is known that the majority of lecturers are essentially self-taught in these respects. This is especially true in relation to IT-based teaching (Eley and Eley 1995). Smith (1992) characterised IT training for teaching as an extreme example of the 'shop floor' approach to staff development, whereby responsibility is devolved to the lowest level and individual academics are expected to initiate their own activities. Hammond (1992) and Eley and Eley (1995) also found general patterns of DIY IT-related training which relied heavily on academics teaching themselves requisite skills. Allegedly this led to wide variations in the implementation of new teaching methods, as lecturers' levels of motivation to obtain relevant competencies and the time and facilities they had available for the purpose differed substantially, both among individuals and institutions. Such findings match those of Jackson *et al* (1999) who reported that 68% of a sample of 1,340 UK university lecturers in 17 institutions and eleven subject areas preferred to turn to colleagues rather than computing support staff for help in using electronic information sources. This was despite the fact that their colleagues might be little more knowledgeable about these matters than themselves. Lack of training was commonly cited as the main impediment to the use of electronic information sources. In the light of the above, a primary aim of the present research was to ascertain the extents to which members of a sample of university lecturers relied on informal local contacts (rather than central university teaching and learning support staff) to obtain know-how about new teaching methods (including

techniques of groupwork management as well as IT).

### *Tacit knowledge and information dependence*

It is pertinent to record that a number of surveys of commercial organisations have suggested that two-third's of the average manager's information and knowledge about operational issues derives from informal face-to-face interactions and only one third from documents (see Davenport 1994). One-to-one knowledge transfers within informal networks occur naturally and, according to Dougherty (1999), are essential for an organisation's success. The knowledge acquired in this manner relates immediately and directly to the personal needs and objectives of the recipient, who is fully in control of the learning situation. Work colleagues are likely perhaps to share common values, beliefs and approaches to issues with the person who is searching for knowledge, resulting in fewer misunderstandings and better communications. This is known to be especially important when "tacit" knowledge is being transferred and much *operational* know-how is quintessentially tacit in nature (see Grant 1997). Tacit knowledge is typically based on personal experience and observation; depends heavily on *ad hoc* trial and error; and frequently relies on listening to anecdotal stories about how other people dealt with problems. Often it involves "intangible insights, beliefs, hunches and intuitions" (Nonaka and Takeuchi 1995, 17) that are manifest only in their application (Grant 1997). Thus, tacit knowledge is difficult to unravel and communicate, ephemeral and rarely written down. Such knowledge, according to Clippinger (1995) is "typically neither created nor shared through conventional traditional channels but rather emerges and evolves from the bottom up in a somewhat helter-skelter pattern" (28). Hence it is commonly transferred *via* conversations on-the-job.

Notwithstanding the potential usefulness of one-to-one informal transmissions of knowledge among colleagues, exchanges of this type bring with them the possible problem of 'information dependence'. The information dependence hypothesis posits that individuals want to base their thoughts and actions on

those of others and rely heavily on people they respect in order to interpret the propriety of their behaviour. Thus the danger arises of unquestioning conformity to suggestions made by highly regarded peers who are seen as expert in a subject, resulting perhaps in the application of inappropriate methods (Cherrington 1989). Information dependence is known to be especially problematic in two situations. The first is when the recipient has no knowledge or experience whatsoever of a certain topic or activity and hence wants to set his or her behaviour against norms established by someone who is both respected and known to have encountered similar situations previously. The second is where a person is faced with something he or she finds frightening or threatening (Schachter 1959). Within these circumstances, advice from people with common interests and who are perceived to possess first hand experience is warmly welcomed. The recipient wants help with understanding how he or she *ought* to feel and act in an uncertain and/or intimidating situation. Anyone providing such assistance, according to Moenaert *et al* (1992), might be perceived as having a credibility and situational relevance that is not objectively justified. As the likelihood of the occurrence of information dependence has not previously been investigated in a university context, a second objective of the study was to establish whether the ways by which lecturers actually obtain know-how about new methods have the potential to create difficulties in this regard.

The research also examined the proposition replete in the knowledge management literature (see Kerssens-Van Dronglen *et al* 1996 for details) that team-working facilitates the transmission of tacit knowledge among individuals. According to Kolb *et al* (1974), working in a team provides participants with concrete experiences which lead to reflection and conceptual thought and hence the *application* of what has been learnt to other activities. Teamworking is said to generate feelings of personal responsibility (Hauptman 1986), enhance the flow of communications and improve interpersonal relations leading to more frequent transfers of knowledge, particularly tacit knowledge, (see Lee 1994).

### *Barriers to and motivators of the adoption of new methods*

The study explored various barriers which previous academic literature in collateral fields has suggested might inhibit the implementation of new working methods. For example, Bennett and Kottasz's (2001) survey of undergraduate students' attitudes towards IT-led teaching techniques found that individuals who were innately innovative and who in general welcomed change were more likely to embrace IT-based approaches to teaching than others. By analogy it is reasonable to posit that a comparable situation exists in relation to a university's teaching staff, so this was a further proposition examined in the course of the present study.

"Technophobia" also emerged from the Bennett and Kottasz (2001) study as a significant negative influence on student attitudes towards IT-based teaching methods. Computer technophobia among lecturers might equally cause them to avoid IT-led instructional techniques. According to Morgan *et al.* (2000), technophobia in the academic world is associated with 'lower expectations, poorer task performance, greater anxiety and debilitating thoughts' (73). It is pertinent to enquire, therefore, whether lecturers who fear technology avoid learning about teaching methods with a technological dimension. Fear in general, not just fear of new technology, might also inhibit the acceptance of the latest instructional techniques and not just in relation to IT. Forsyth *et al.* (1996) identified fear of change and fear of not possessing the skills and/or knowledge to cope with new methods as major causes of university lecturers' resistance to adopting new approaches to teaching. Hence the questionnaire distributed to the 296 lecturers contained items relating to these matters. Additionally, it incorporated items concerning the respondents' perceptions of the levels of senior management support for innovatory teaching within their institutions. Smith (1992) concluded that lecturers might be unlikely to invest time and energy in acquiring new teaching skills if their employing institutions would not recognise and reward such investments. Chase (1998), similarly, found that the take up of new methods in 80% of a sample of 500 commercial firms was

adversely affected by factors connected with “negative organisational culture” (39). Hare and McCartan’s (1996) report of their experiences of delivering eight workshops to identify the key factors that enabled 88 university academics to become confident in using IT for their teaching activities concluded that senior management support and the provision of adequate resources were essential.

### *Career involvement*

Numerous studies have found that on-job learning performance is significantly higher among employees who are committed to their careers and/or heavily involved in their jobs (see Cheng and Ho 2001 for details of relevant literature). Career commitment means identification with a series of related jobs of gradually ascending status within a specific field, such as academia. Lecturers with high levels of commitment to university teaching as a career might want to learn as much as possible about teaching methods, as this will enable them to improve their job performance and hence their career prospects. Job involvement is a construct correlated with but not the same as, career commitment. It may be defined as the degree to which an employee identifies psychologically with his or her work or the importance of work relative to the person’s total self-image (Lodahl and Kejner 1965). Individuals with high job involvement identify closely with their jobs and find that work satisfies their psychological requirements (Kanungo 1982). Such people want to improve their job-related skills and, in consequence:

- (i) perform well on training programmes; and
- (ii) learn more and more quickly in the course of informal learning activities (see Cheng and Ho 2001).

Moreover, high job involvement has been found to motivate employees both to learn completely new job-related skills (Noe 1986) *and* to transfer the new skills they have learned to others (Noe and Schmitt 1986; Facticeau *et al* 1995).

Arguably, a lecturer’s job involvement might be affected by his or her opinions of the

students the lecturer teaches. Liking for a person or group is known to influence an individual’s perceptions and cognitions of, motivations towards and decision-making and interpersonal judgements about, that person or group (see Baron and Byrne 1997, Chapter 7 for details of empirical studies supporting these propositions). Dislike can lead to negative behaviour *vis-à-vis* members of the disliked group or, if the dislike cannot be reflected in overt actions, e.g., because of institutional rules or peer group pressure, it might manifest itself (more subtly) in a reluctance to become involved with group members (Monteith 1996). Thus, lecturers with poor opinions of contemporary students, lecturers with low levels of regard for their students’ motivation, competence and behaviour, might not feel as committed to their teaching duties as others and hence might be less inclined to invest time and effort in learning about and practising the latest instructional methods.

### **The investigation**

A questionnaire was drafted consequent to a comprehensive review of the above mentioned academic literature. The questionnaire was pre-tested, revised and the final version distributed to a sampling frame of 407 lecturers at all levels of seniority in ten academic departments in a ‘new’ university in London. After a follow-up, 231 replies were received, representing 57% of the sampling frame (see endnote 1). The 231 responses were subjected to a discriminant analysis to identify the variables that best differentiated lecturers who utilised new teaching methods extensively from those who did not. The questionnaire was then distributed to a further 300 lecturers in comparable departments in two other new universities (N = 75 each) and two old universities (N = 75 each). Despite a follow-up, the response rate from the 150 questionnaires sent to staff in the new universities was only 24% and from the old universities 20%. Telephone and other enquiries to randomly selected recipients in the wider sampling frame revealed that concerns about the confidentiality of replies in conjunction with a feeling that ‘strangers’ to the institution were asking sensitive questions seemingly discouraged response. Replies on the lines of: “Why are you poking your nose

into our business?" were typical. Hence, the 65 responses received from the four additional universities were pooled to form a holdout sample to which the outcomes to the original discriminant analysis were applied in order to assess the predictive validity of the findings from the main sample.

### *Measurement of variables*

The study employed a mixture of *ad hoc* items and previously validated constructs in order to address the questions arising from the literature discussed in prior sections. All items were scored on 5-point scales: 5 = strongly agree, 1 = strongly disagree. Job and career involvement were assessed *via* minor adaptations of the instruments developed and validated by Cheng and Ho (2001) on the basis of past empirical research in the field. Five items related to job involvement: e.g. "University teaching means a great deal to me" and "I obtain great satisfaction from being a university teacher". A further five items concerned career involvement: e.g. "I am fully committed to a long-term career as a university lecturer". Individual innovativeness was measured using the five lead items of MacEvoy's (1997) change leader inventory, suitably reworded for the academic sphere. A "change leader" is someone whose approach to life "emphasises the new, the different, the informative, the stimulating and the challenging" (290). Such a person, according to MacEvoy, readily accepts innovations. An example of these items is: "I frequently experiment and innovate in relation to the ways in which I teach". The techno-phobia construct was measured through the four items employed by Bennett and Kottasz (2001) to evaluate student tendencies in this regard: e.g. "The prospect of having to use IT-based teaching methods makes me feel very afraid". Three items queried the respondent's level of IT literacy: e.g. "I would describe myself as an IT-literate person". These were also taken from the Bennett and Kottasz (2001) investigation. Information dependence was assessed *via* four fresh items created for the present study and based on the propositions of Schachter (1959), Cherrington (1989) and Moenaert *et al.* (1992). Examples are: "I trust the advice and suggestions (regarding the implementation of new teaching methods) of my immediate workplace colleagues much more than those of the

University's teaching support services" and "The help I receive from immediate colleagues (concerning new teaching methods) is much more credible and relevant to me than assistance from official sources". A factor analysis was conducted to confirm the unidimensionality of the information dependence construct and the above mentioned constructs adapted from other literature. Significant single factor solutions emerged in all cases (see endnote 2).

*Ad hoc* items were used to query the respondent's age, grade, length of service, subject area and whether he or she possessed a formal teaching qualification, a post-graduate certificate in education for instance. Likewise, for factual questions concerning the lecturer's views on various potential triggers encouraging and barriers inhibiting the application of new teaching technologies and methods (see Table 1) and the person's opinions of the value of new teaching methods in general. Respondents were asked to tick off which, if any, of various IT-based technical devices they used in the course of their teaching work: PowerPoint, electronic blackboards, Webpages, electronic discussion groups, computerised marking of tests, rostrum projectors, etc. A similar question followed concerning the group-work methods the lecturer employed, ranging from basic student group discussions or presentations of cases or issues during class, buzz groups and role plays, through to more esoteric exercises such as value line-ups, fishbowls or cross-over exercises (a definition of each technique was provided). The penultimate section of the questionnaire asked the practical ways in which the respondent *actually* learnt about the latest teaching technologies and methods. This was followed by four items concerning the lecturer's involvement in teamwork: e.g. "Much of my teaching is done as a member of a team" and five items regarding his or her attitudes towards students: e.g. "The students I teach nowadays are (a) much weaker academically, (b) more discourteous and less well-behaved, than in the past". It emerged that the four teamwork items were highly inter-correlated and loaded onto the same factor in a factor analysis (see endnote 2).

A.	Incentives		
		Mean	SD
(a)	Increasing class sizes have forced me to adopt new teaching technologies and methods	4.21	0.81
(b)	The University's management has forced me to adopt new teaching technologies and methods	4.04	1.20
(c)	Nowadays students expect lecturers to employ new teaching technologies and methods as a matter of course	3.97	0.88
(d)	These methods make the process of learning more interesting for the student	3.42	0.95
(e)	The observation of other lecturers adopting new teaching methods and technologies made me want to do the same thing	3.39	1.02
(f)	I believe that my future career advancement depends on my ability to keep abreast of the latest teaching methods and technologies	2.69	1.16
(g)	I feel that many of my existing teaching skills are becoming obsolescent	2.51	1.27
B.	Barriers		
		Mean	SD
(a)	The university does not have the facilities to enable the effective implementation of IT-based teaching methods	3.96	1.03
(b)	I do not have the time to develop new approaches to teaching	3.71	0.79
(c)	I do not really have the skills and/or knowledge necessary to apply these new methods and/or technologies	3.66	1.29
(d)	I have not received sufficient training to be able to implement these new methods	3.60	1.01
(e)	The University's culture is not conducive to the implementation of new approaches to teaching	2.39	1.10
(f)	I have no idea of what computer-based teaching methods can do to improve my teaching	2.26	1.18
(g)	The time and effort needed to acquire the skills required to apply new teaching methods will not be recognised and rewarded by the institution	2.21	1.0
(h)	These methods are nothing more than trendy gimmicks with no long-term educational value	1.45	0.86
(i)	These methods prevent students from reaching the same level of competence they would reach if they were taught in traditional ways	1.42	0.88
(j)	I find the prospect of increasingly having to use these new methods and/or technologies in my teaching to be frightening	1.10	0.75
(k)	I am too old to start using computer-based teaching methods	1.00	0.90

5 point scales: 5 = strongly agree; 1 = strongly disagree

**Table 1: Incentives and Barriers to the Adoption of New Teaching Methods**

## Results

The lecturers in the total 296-strong sample were on average 46 years old and had been in university teaching for 12 years. This conforms closely to the national average: in 1999/2000, 28% of all UK higher education lecturers were over 50 years of age and the proportion was increasing (Utley 2001); 59% were aged 40 or over and had an average of ten years of full-time service (HESA 2001). Two-thirds of the present sample were Senior Lecturers in new universities or Lecturers in old universities. A fifth were Principal Lecturers in new universities, Senior Lecturers in old universities, Readers or Professors. The remainder were Lecturers in new universities. There was a relatively even split among lecturers in the social sciences, humanities and business and management studies. Eighty per cent of the sample was male compared with the national average of 73% (HESA 2001).

Overwhelmingly the respondents were both committed to their careers as university teachers and heavily involved with their work. 76% of the sample ticked the agree or strongly agree categories of a composite formed from the five career commitment items and 79% agreed/strongly agreed with a composite created from the five involvement questions. The great majority of respondents (80%) agreed or strongly agreed that the student of today is much weaker academically than in the past. 60% believed that the contemporary student is less self-disciplined than previously; 40% felt that students nowadays are more discourteous and less well-behaved. However, only 16% agreed/strongly agreed that the modern student is less enjoyable to teach compared to past generations.

A large majority (72%) of the respondents felt that new teaching methods, whether IT or groupwork-based, made the process of learning more interesting for the student (see Table 1A [d]). The main triggers to the adoption of these methods, as shown in Table 1A, were increasing class sizes, management pressure, the perception that students *expect* lecturers to apply these techniques and the example set by peers (items A [a] to [c] and [e]). Item (a) of Table 1A was supplemented by a further item worded: "The use of IT-

based teaching and other new methods is necessary in order to cope with increased student numbers in the absence of corresponding increases in physical or financial resources". Over 70% of the sample agreed or strongly agreed with this proposition. A major barrier to the adoption of new teaching methods was the (alleged) lack of time available to develop fresh approaches (Table 1B [b]). Insufficient training and lack of self-confidence in personal skills and knowledge were also cited as important problems (B [c] and [d]). These findings are consistent with the outcomes to past research in the area, e.g., Hammond (1992); Smith (1992); Eley and Eley (1995); Hare and McCartan (1996); Robertson *et al.* (1996); Jackson *et al.* (1999). However, few respondents feared the prospect of having to use new methods or technologies (B [j]) and the age of the individual was not (in general) a critical factor (B [k]). The age category of the respondent did not correlate significantly with any of the major dimensions of the study.

There was little support for the idea (B [h] and [i]) that new teaching methods were nothing more than trendy gimmicks that held back the student. So far as IT-based instructional methods were concerned, the lecturers in the sample routinely believed that institutions did not have proper facilities to enable their effective implementation (B [a]). This finding applied equally in the main sample and the holdout sample. It was a surprising result in relation to the former, perhaps, because the university within which the main survey was conducted had a ratio of computers to students that placed it in the top decile of UK higher education institutions and all its large lecture theatres were fully equipped with the latest IT teaching equipment. Although it was not possible to obtain information on the situations prevailing in the other universities covered by the study there were no *a priori* reasons for supposing that their IT provision was poor. Indeed, considering the particular institutions involved, the reverse was more likely to have been the case.

### *Sources of assistance and information dependence*

Lecturers in the sample were largely self-taught so far as the use of IT and/or

groupwork in lectures or classes was concerned, a result confirming previous findings (e.g. Smith 1992; Eley and Eley 1995). For both IT and groupwork more than 55% of the sample agreed/ strongly agreed that their employment of new methods resulted from their individual initiative and not from institutional strategy:

- (ii) most of their know-how in these regards had been picked up informally *via* self-investigation rather than from courses or seminars and
- (iii) they relied heavily on tips and information from immediate colleagues in the workplace. 70% of the respondents agreed or strongly agreed with the statement “I really would like to learn more about the latest teaching methods and technologies”.

Table 2 shows the main sources of advice and information to which the lecturers in the sample turned in order to satisfy their desires for knowledge in these respects (5–point scales: 5 = strongly agree, 1 = strongly disagree). It is interesting to note from Table 2 that although a substantial majority of the respondents were fully aware of the in-house

training programmes available within their institutions (item [b]), relatively few actually attended them! This is a somewhat puzzling outcome since more than 68% of the sample agreed/strongly agreed with each of two further questionnaire items asking whether they believed their universities' teacher training courses were relevant and of good quality. Possibly, time constraints (see Table 1B item [b]) prevented people from transforming their thirst for knowledge by attending what were generally perceived as high quality training programmes.

Clearly, consultations with friends and colleagues constituted the major source of advice and information concerning new teaching methods (Table 2 items [a], [c] and [d]). Reading books or articles in professional magazines or newspapers was not a regular occurrence (item [g]). A separate questionnaire item asked who exactly the respondent was *most* likely to approach for help or advice concerning his or her classroom teaching activities. 35% specified junior colleagues, 30% senior colleagues, 18% university supplied documents or Webpages and just 17% a central university teaching support unit. Such heavy reliance on informal discussions with workplace colleagues begets

		Mean	SD
(a)	If I need to find out about new teaching methods or technologies I am more likely to consult friends and/or colleagues within my own or other departments than to approach the central administration	4.01	1.1
(b)	I have a good knowledge of the teacher training courses/seminars available within the university	3.90	0.98
(c)	I regularly ask friends and/or colleagues for help or information regarding new teaching methods or technologies	3.32	1.07
(d)	Colleagues regularly pass on to me things they have learned about new teaching methods and technologies	3.10	1.13
(e)	I regularly exchange lecture notes and other teaching materials with teaching colleagues	2.45	1.06
(f)	I regularly attend short courses, workshops or seminars on teaching methods	1.88	0.76
(g)	I regularly read books or articles in professional journals, magazines or newspapers about teaching methods	1.49	0.69

**Table 2: Sources of Advice and Information Concerning New Teaching Methods**

the possibility of substantial information dependence arising in relation to these matters. This seemingly was the case. 66% of the sample agreed/strongly agreed that they “relied heavily” on the help and suggestions of immediate colleagues *vis-à-vis* new teaching methods, 58% believed that such information was “more credible” “than that received from their university’s central teaching support service (50% for “more reliable”); and 56% viewed it as more trustworthy (see endnote 3).

### Statistical analysis

The lecturers were grouped according to their subject areas and then into broader categories for social sciences, humanities and business studies. A search for possible disparities in response patterns with respect to the various groupings *vis-à-vis* the items listed in Tables 1 and 2 was completed using the ANOVA facility on SPSS. This exercise was conducted as, in the field of information technology at least, a number of previous studies have found significant differences among the take up rates of IT in the various subject disciplines (see Jackson *et al*, 1999, 321 for details of relevant investigations). Specifically it has been alleged that, compared to staff in the social sciences, humanities lecturers are more likely to work alone (Stone 1982), to rely heavily on hard copy library based materials rather than on electronic resources (Watson-Boone 1994) and in consequence to be slower to adopt IT in their work (Wiberly and Jones 1994). Business studies academics, conversely, have been reported to use electronic information sources extensively (Jackson *et al*. 1999; see also Bennett and Kottasz 2001). In the present study, however, no significant differences in the responses shown in Tables 1 and 2 were discernible among the various subject or discipline groups. This applied to both the main sample and the holdout sample.

#### *The discriminant function*

As previously stated, factor analyses of the constructs adapted from other literature (job and career involvement, personal innovativeness and technophobia) and of the items used to measure information dependence generated uni-dimensional solutions with sound internal reliability (see endnote 2). Hence composite scales were

formed to reflect these variables and employed, together with the *ad hoc* items included in the questionnaire, as variables in two discriminant analyses of the data for the main sample utilising:

- (i) whether a person did (N = 69) or did not use IT-based teaching methods and
- (ii) whether the lecturer was a high or low employer of groupwork, as the categories into which individuals were allocated.

A lecturer was regarded as a low employer of groupwork (N = 190) if he or she only used groupwork for student group presentations or discussions of cases or issues during class and as a high user if the person used these plus any other methods. Discriminant functions were estimated (*via* the step-wise procedure available on SPSS 10) for the 231 respondents in the author’s home university. The parameters emerging from this exercise were then applied to the categorisation of the 65 lecturers in the holdout sample of people in other universities in order to assess the generalisability of the initial results.

Table 3 presents the outcomes to the discriminant analysis, which shows that six variables significantly discriminated between the two groups in each of the analyses: personal innovativeness, the possession of a formal teaching qualification, perceptions of the amount of time available for developing new approaches, management pressures, the conviction that keeping abreast of the latest methods is vital for career success and the belief that new methods and technologies are a waste of time. Two further variables helped discriminate between users and non-users of IT: the IT-literacy composite and the influence of peers (see Table 1 A [e]). The variable reflecting the belief that a lecturer did not possess the skills or knowledge to apply new methods or technologies also emerged as a significant discriminator in relation to IT use but this was significantly (negatively) correlated with the possession of a teaching qualification and thus is not shown in Table 3. Three additional variables explained the high employment of groupwork: regular reading of books or articles about teaching methods and the belief that academic standards have fallen

	Variable	Coefficients*	
		Use of IT	Use of groupwork
(a)	Personal innovativeness	0.69 (10.01)	0.65 (9.89)
(b)	Has a formal teaching qualification	0.62 (9.60)	0.73 (10.44)
(c)	Believes that keeping abreast of the latest teaching technologies and methods is vital for career success	0.69 (10.01)	0.64 (9.61)
(d)	Level of IT literacy	0.65 (9.61)	
(e)	Believes that new teaching methods and technologies are a waste of time	-0.59 (8.99)	-0.70 (10.09)
(f)	Does not have the time to develop new approaches to teaching	-0.60 (9.02)	-0.50 (6.71)
(g)	Regularly reads books or articles about new teaching methods		0.50 (6.71)
(h)	Believes that academic standards have fallen substantially in recent years		0.43 (4.09)
(i)	Influence of peers	0.43 (4.11)	
(j)	Influence of university management	0.40 (3.99)	0.46 (4.26)

\* Standardised Canonical Discriminant Function coefficients. The figures in parenthesis are F-values with (1,299) degrees of freedom. Both Functions are significant at the 0.001 level (Wilks' Lambda [8 df] = 0.769 for the use of IT; Lambda = 0.784 for the use of groupwork).

**Table 3 Discriminant Analysis**

substantially in recent years. Note that the impact of the last item was *positive*, i.e., low opinions of students' abilities stimulated lecturers to utilise groupwork extensively. The discriminant function for the use of IT successfully allocated 86% of all lecturers in the main sample into the correct category. Application of the computed coefficients to the assignment of members of the holdout sample into the two categories for IT utilisation resulted in 49 of the 65 respondents (76%) being allocated to the right group, indicating reasonable generalisability of the model. Corresponding figures for the extensive utilisation of groupwork were 75% for the main sample and 70% for the holdout sample, again suggesting sound reliability.

### Regression analysis

Table 4 presents the results of a regression analysis intended to establish the main determinants of

- (i) the overall favourability of the respondents' attitudes towards new teaching methods and technologies (rather than the extents to which such methods or technologies were actually employed),
- (ii) whether the lecturers regularly passed on to colleagues knowledge they - had acquired regarding new technologies and methods and (iii) the degree to which people wanted to learn about these new technologies and methods and

		A	B	C
(a)	Respondent has a formal teaching qualification	2.47 (3.01)		
(b)	Regularly reads books/articles about new teaching methods	0.55 (2.02)		
(c)	Innovativeness	0.68 (3.96)		0.76 4.02)
(d)	Believes that keeping abreast of the latest teaching methods and technologies is vital for career success	0.47 (2.28)		0.84 (2.66)
(e)	Believes that new teaching methods and technologies make the process of learning more interesting for the student	0.51 (2.74)	2.25 (2.09)	0.90 (3.14)
(f)	Believes that new teaching methods are 'trendy gimmicks'	-0.72 (1.198)	-1.96 (2.33)	-1.22 (2.92)
(g)	Influence of peers (Table 1A item [e])			0.79 (3.28)
(h)	Management pressure (Table 1A item [b])			0.65 (2.19)
(i)	Lack of recognition within the institution		-1.99 (2.12)	-0.73 (2.25)
(j)	Lecturer believes that his or her existing teaching skills are becoming redundant			0.81 (2.10)
(k)	Heavily involved in teamwork		3.01 (2.66)	
(l)	Believes that academic standards have fallen	0.42 (1.99)		

T-values in parentheses. All parameters are significant at the 0.05 level or less.

Dependent variables: A = 'Overall I am favourably inclined towards the use of new teaching methods and technologies.'

B = 'I regularly pass on to other lecturers the things I have learned about new teaching methods.'

C = 'I really would like to learn more about the latest teaching methods and technologies.'

**Table 4: Regression Analysis**

(iii) the degree to which people wanted to learn about these new technologies and methods.

As this was a purely exploratory study, all constructs and dimensions were entered as potential explanatory variables *via* the stepwise procedure available on SPSS 10 and removed if they failed to attain significance at the 0.05 level. It can be seen from Table 4 that an individual lecturer was more likely to be favourably inclined towards new methods the more he or she was innately innovative; believed that knowledge of these methods and technologies was essential for career success and that his or her existing teaching skills were becoming obsolescent; read books and articles about these matters; and felt that IT-driven teaching and groupwork made the process of learning more interesting for the student. Lecturers with a formal teaching qualification were significantly more prone to express positive attitudes than others. Respondents who believed most strongly that academic standards have fallen in recent years were more favourably inclined than others towards the use of new methods.

The frequency of transmission of information about new teaching methods to colleagues (regression B) was significantly associated with the extent to which a lecturer worked as a member of a team in relation to his or her teaching duties and with the perception that students find these new methods interesting. Lack of institutional recognition and feelings that new teaching methods were “trendy gimmicks” seemingly inhibited diffusion. The major influences on the desire to learn more about new methods are shown in Table 4 regression C. All these explanatory variables correspond with *a priori* expectations. The desire to learn correlated significantly with the regular reading of books and articles about new teaching methods.

### **Conclusion and managerial implications**

The lecturers in the sample were largely self-taught so far as the application of new teaching methods were concerned, in line with the findings of previous research in the field (cf. Smith 1992; Eley and Eley 1995). Respondents reported that, in the main, they

obtained their information informally and that the information so gathered was regarded as more credible and trustworthy than that available from “official” sources (cf. Davenport, 1994; Nonaka and Takeuchi 1995; Grant 1997; Dougherty 1999). Information dependence did appear to have occurred. The main triggers causing people to want to know more about new methods involved the beliefs that these methods made the learning experience more interesting for students and that familiarity with them was essential for career success. Peer influence and managerial pressures also exerted significant effects. The possession of a formal teaching qualification was a major determinant of whether an individual did or did not actually implement new teaching methods. Note, moreover, that having a teaching qualification correlated significantly [ $R = 0.42$ ] with the use of an institution’s central services to obtain help and advice concerning teaching methods, as opposed to approaching friends and colleagues. Lack of time to develop new approaches and feelings of personal inadequacy *vis-à-vis* their application were viewed as important barriers to adoption (cf. Hammond 1992; Eley and Eley 1995). Other factors inhibiting implementation were perceptions of the absence of recognition or reward within institutions (cf. Smith 1992) and the existence of inappropriate internal cultures (cf. Chase 1998). Heavy involvement in team-based teaching did seem to facilitate the transmission of information concerning new teaching methods (cf. Kolb *et al.* 1974; Hauptman 1986; Lee 1994; Kerssens-Van Dronglen *et al.* 1996) but was not significantly associated with any other dimension of the analysis.

Large majorities of the respondents in both samples were fully committed to their careers as lecturers and were highly involved in their jobs. Variations in individual levels of job or career involvement did not exert significant impacts on any of the dependent variables. Hence, the conclusions of several previous studies on this matter (see Cheng and Ho 2001 for details) do not appear to hold in higher education institutions. However, the belief that keeping abreast of new methods would improve a lecturer’s career prospects did have significant consequences. There was no substantive evidence of fear or

techno-phobia inhibiting the implementation of new technologies within this particular sample, contradicting the suggestions of Forsyth *et al.* (1996) and Bennett and Kottasz (2001).

Two major implications for university management ensue from the outcomes of the present study. Firstly, the finding that most of the respondents wanted to learn much more about new methods but cited lack of time as a dominant reason for not doing so, suggests the need for very short training events, lunch time seminars perhaps, rather than conventional longer programmes. Further research is necessary into the feasibility and effectiveness of intensive 30 to 60 minute teacher training activities. Secondly, the crucial importance of peer pressure as an inducement to lecturers to adopt new methods indicates the desirability of a management identifying within its teaching staff a handful of highly influential individuals whose support may be enlisted to champion the cause of new teaching methods. University managements need to realise that people who are known, liked and trusted as teaching peers are far more likely to be believed and emulated than any number of "official" role models. These "teaching champions" could be invited to participate in planning the implementation of new methods and in solving problems as they arise. Managements must also recognise and proclaim to their teaching staffs the dangers of information dependence. Hence they should constantly stress the *expert* natures of their central teacher training services and continuously remind people of the credentials and availability of the staff within them. Additionally the practical payoffs to personal investment in acquiring new teaching skills should be emphasised. Robertson *et al.* (1996) pointed out that teachers are generally unwilling to devote precious time to attending training courses unless they are able to identify tangible pedagogical benefits or improvements in administrative efficiency at the end of a programme. It follows that the advantages that the use of new methods in the classroom can bestow must be clearly set out in advance in order to induce lecturers to attend courses.

A number of limitations relating to the study need to be mentioned. The survey was based primarily on responses from lecturers in one new university in the London area, with just 65

contributions from staff in four other universities. There is a need, therefore, to replicate the investigation in a wider range of institutions. Also the restrictions imposed by the use of a questionnaire to collect information have to be recognised. The questionnaire did not include open-ended questions, as the fundamental issues to which such questions should relate were not apparent at the time the questionnaire was distributed. Thus, it would be useful to complete further studies employing in-depth interviews to explore in detail the antecedents of some of the outcomes emerging from the present investigation, especially the issue of information dependence and the consequences of self-instruction. Another valuable exercise would be to examine the levels of awareness of university managers and staff developers of the incentives and barriers to the adoption of new methods revealed by this study. An additional caveat associated with the results is that some of the main constructs used in the investigation were adaptations of measures developed and validated in academic disciplines unrelated to education: e.g. human resource management for job and career involvement; marketing for personal innovativeness and teamwork. There is a need to develop *ab initio* constructs specifically tailored to educational institutions and the people who work within them. Knowledge about new teaching methods is a valuable asset in its own right and it is important that it be retained within the knowledge base of a university. Thus, measures are needed to make this knowledge visible, to codify it through documentation and to share it among an institution's teachers. Certain knowledge management systems and procedures employed by commercial organisations might be useful in these respects (see Bennett and Gabriel, 1999 for details). Thus, for example, an "expert network" could be created whereby individual queries are sent to a central section which (anonymously) redirects them to expert specialists within (or sometimes outside) the university. Total confidentiality is necessary here as the people most in need of help may be reluctant to seek it for fear of being regarded as personally inadequate (cf. Davenport 1997). An alternative would be for a university to put together a "knowledge map" containing details of where information on

“modern” teaching methods is located. Seemann and Cohen (1997) likened knowledge maps to ‘corporate yellow pages’, showing the repositories of codified knowledge and sources of useful information listed by topic rather than department. A major purpose of a knowledge map is to prevent individuals reinventing the wheel consequent to ignorance of the help that is available and/or of the past experience of other people. “Learned lessons programmes” which analyse information on problems previously experienced by individuals in similar circumstances might also be useful. Another device whereby people come together to record their experiences and learn from others are “communities of practice”, defined by Gupta and Rohe (1997) as ‘groups of individuals with a common interest created by their exposure to similar problems’ (178). Possibilities for applying these, and other, techniques of knowledge management within universities are clearly worthy of further investigation.

## Endnotes

1. A third internal mailing asked anyone who had not responded to complete and return a slip upon which they could tick off their reason for non-response. Thirty-two of these slips were returned, indicating that “I never complete questionnaires” was the main reason for not participating (44%), followed by “lost the questionnaire” (32%). Hence there are no grounds for believing that the people who completed the questionnaire were not representative.
2. The items in each group were subjected to a principal components analysis using SPSS 10 followed by Varimax and Oblimin factor rotations. In every case the rotations failed to produce more than a single significant factor. Confirmatory factor analyses were completed *via* the AMOS 4 package (except for the IT literacy measure which contained only three items) to compare the one factor solutions with two factor alternatives. The former were significantly superior to the latter in terms of all conventional goodness-of-fit measures and explained at least 68% of the variation in each set of data. Items within the constructs were highly intercorrelated ( $R > .6$  in all cases)
3. It is interesting to note that items (a) and (c) of Table 2 concerning the widespread use of friends and colleagues to obtain information correlated significantly ( $R > 0.6$  in each case) with items (e) and (g) of Table 1 relating to perceptions of inappropriate cultures and lack of recognition within a university. The latter items were also significantly correlated with all the information dependence items ( $R > 0.5$  in all instances). In other words, information dependence occurred to a substantially higher degree among lecturers who did not believe that the cultures within their institutions were conducive to the implementation of new approaches to teaching.

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