

Overcoming Resistance to Networked Learning and Teaching Modalities—A Longitudinal Comparison of Changing Teaching Staff Attitudes Towards Learning Technologies

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This article considers a comparison of questionnaire survey results from teaching staff in the 1998 Department of Pharmacy teaching staff cohort with the same School of Pharmacy and Biomolecular Sciences cohort four years later (2002) at the University of Brighton. The effectiveness of solutions—proposed in previous work—seeking to overcome staff resistance to using computer-based learning and teaching methods is evaluated. It is reported that all staff now use e-mail, with half regularly doing so to communicate with or in response to communication from students. There is a shift to staff using more Computer Aided Learning (CAL) packages in their teaching, with a much wider range of teaching media in use.

Conclusions are drawn that identified an increased awareness among staff as to what computer-based learning and teaching methods can do and how they can be integrated into existing teaching. A move away from technical and hardware barriers towards more pedagogical issues of learning technology use is identified. Suggestions, such as increased one-to-one support and training and good-practice dissemination, are proposed to enable the school to achieve its aim of allowing all staff to make appropriate choices regarding the use of learning technologies within their teaching.

Keywords: Teaching staff attitudes; Computers; ICT; Learning and teaching; Teaching staff

INTRODUCTION

In our 1998 survey (Sosabowski *et al.*, 1999) we reported that in order to address the resistance of

staff within a Department of Pharmacy to computer-based learning and teaching methods, solutions such as enhanced staff training and education, student driven demand for IT-based resources, “efficiency realization,” uniformity of hardware and a development of cross-platform resources should be considered (Sosabowski *et al.*, 1998a,b; Herson *et al.*, 2000) after the effective evaluation of the requirements, ability and expectations of the target audience (Sosabowski *et al.*, 1998b).

Since then, most of the literature in the pharmacy education arena, concerning the increasing use of Information and Communications Technology (ICT) in Learning and Teaching (L&T) relates to student perception, uptake and overcoming any resistance to such use. Sowinski *et al.* (2000) reported the evaluation and successful implementation of an Internet training module for traditional and non-traditional Doctor of Pharmacy (DPharm) degrees, as do O’Neil and Poirier (2000). ICT has been successful when combined in pharmacy curricula with Problem Based Learning (PBL) (Abate *et al.*, 2000) and the perceptions of qualified pharmacists of Internet-based learning have been evaluated by Wright (2000). Indeed, reports of student evaluation and attitudes to pharmacy L&T innovations, which involve the Internet or other networked-learning technologies, are now frequent (Chávez *et al.*, 2002; Kasiar *et al.*, 2002; Wellman and Larson, 2002). We have reported (Herson *et al.*, 2000; Olivier *et al.*, 2001) on the increased demand for networked L&T

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resources from pharmacy students as Intranet resources have been developed in the School.

There has been relatively less published on the difference in and development of attitudes of teaching staff to ICT in L&T and the little that has been reported lies outside the pharmacy education field. Schwieso (1993) originally reported on staff attitudes within an IT faculty, stating that staff made use of IT for a variety of teaching, research and administrative purposes and attitudes toward ICT were utilitarian and pragmatic. Creanor and Littlejohn (2000) have observed that the trend towards larger class sizes and work-based learning in HE requires staff to be equipped to switch from traditional L&T modalities to communicating with students using ICT. Teaching staff face a challenge in developing the requisite skills to effectively use ICT in Learning and Teaching and such skills can only be acquired through practice, understanding of the pedagogy and awareness of the options available. The authors examine how attempts can be made to bridge the skill gaps by enabling teaching staff to experience Internet communication from the perspective of both student and teacher.

Steel and Hudson (2001) reported on the perceptions and experiences of teaching staff with regard to the increasing demand for ICT usage. For such L&T resources to function, they concluded that there must be an increase in communication across university institutions around the implementation and development of such technologies, not only between teaching staff but also administrators, managers and students. Littlejohn (2002) observes that a contributing factor to flawed course design in Higher Education (HE) is generally the adherence of teaching staff towards passive and didactic methods of on-line L&T. This problem could be reduced potentially by offering Continuing Professional Development (CPD) opportunities that enable staff to efficiently gain the requisite skills and knowledge needed to incorporate new teaching methods within their course design.

Brakels *et al.* (2002) reported on the process of total ICT-implementation in education throughout a complete faculty via a plan consisting of three lines of activities, one of which addressing staff-based issues with respect to implementation of a Managed Learning Environment (MLE).

To our knowledge, there is no report concerning differing staff attitudes toward ICT in the pharmacy education arena. In this article, the changes in teaching staff attitudes toward ICT usage in Learning and Teaching in the four years since our last survey are reported, along with the level of success resulting from solutions to some of the problems uncovered in the 1998 survey.

BACKGROUND

Over the past four years, the School of Pharmacy and Biomolecular Sciences, University of Brighton, has invested significantly in new Personal Computers (PCs) for all teaching staff, predominantly using the same operating system, Microsoft Windows NT[®]. Fast network-access to all machines has additionally been supplied to allow improved e-mail and Internet access. The purchase of new PCs has also made the main staff computer platform consistent with the main platform used by students. Previously, there was a mixture of Apple Macintosh and PC (IBM-clone) platforms. All staff now use Microsoft Office[®], as opposed to various Macintosh packages used in 1998, making document sharing within the School less problematic.

The School also had its own IT officer responsible for supporting and training staff over the period of the study, as well as continued support from the central University computer centre.

In this work, an assessment of the effectiveness of the solutions proposed in our previous work, aiming to overcome the perceived staff-based resistance to networked L&T resources, is undertaken.

METHODOLOGY

The original 1998 survey was carried out by means of a questionnaire (Sosabowski *et al.*, 1999) distributed in paper copy to teaching staff within the then Department of Pharmacy. It held a response rate of 70%.

In order to aid analysis of the data, the 2002 questionnaire was created as a web-page form with on-line submission. The link to the questionnaire was advertised to staff by e-mail from a researcher outside the school as well as follow-up e-mails from academic staff within the school. Respondents were invited to include their name on the questionnaire for follow-up interviews and most supplied their name. Twenty completed questionnaires were received via this on-line form. Known non-respondents were then provided with a paper copy of the questionnaire that generated a further eight completed questionnaires. The final response rate for the 2002 survey was 65%.

The 2002 questionnaire was based as closely as possible on the 1998 questionnaire for a direct comparison but some questions were adjusted to reflect known changes over the past four years and rephrased to better match the overall aims.

Both questionnaires (1998 and 2002) are fully listed in the appendices.

RESULTS AND DISCUSSION

The number of teaching staff in the School has grown slightly in size over the four years between questionnaires. From an original response rate in 1998 of 70%, the 2002 questionnaire resulted in a similar, 65% response rate (Table I).

Despite the change in format of the questionnaire from paper to electronic, the response rates were similar in both years. In 2002, non-respondents were reminded individually to complete the questionnaire, in most cases to no effect. There is no evidence to suggest that these non-respondents held different attitudes to computer technology than the respondents.

As an internal survey, an optimum response would have been 100%; however, there is anecdotal evidence of a corporate aura of "questionnaire-overload" among some teaching staff that may have contributed to the lower than hoped response rate in both surveys.

Teaching Experience

This question, which was rephrased in the 2002 questionnaire to encompass the respondent's full teaching career as opposed to merely their time at the University of Brighton, looked to see if there was an overall shift in teaching experience across the surveyed staff (Tables IIa,b).

Although the two sets of results cannot be directly compared, it seems the spread of teaching experience among staff has not undergone a significant shift over the period of the study. If there had been a majority of new staff to teaching, any shift in attitude could be attributed to such a development. However, it shall be shown later that this is not the case.

E-mail Use

Staff were first asked to indicate the main uses to which they put e-mail (Table III). No respondents claim that they do not routinely use e-mail and no respondents claim that they use e-mail for social use more than work were the most obvious aspects of this question's response. Across the University and within the school, e-mail is now an accepted tool of

TABLE II Staff cohort teaching experience at Brighton (a) 1998; (b) 2002

(a)	0-2 (%)	3-4 (%)	5-7 (%)	8-12 (%)	13+ (%)
For how many years have you been a lecturer at Brighton?					
1998	21	25	11	14	29
(b)	1-3 (%)	4-6 (%)	7-9 (%)	10-12 (%)	13+ (%)
For how many years have you been a lecturer?					
2002	18	25	18	7	32

work and all staff are expected to regularly read their e-mail, as opposed to the situation in 1998 where paper copies of memoranda were commonly distributed in addition to being circulated by e-mail. This was to compensate for shortages in equipment and staff ICT skills.

An attempt was then made to gauge whether the increased use of e-mail between staff transferred to a communication tool for staff and students. This question was not asked in 1998 (Table IV). Nearly all staff have now been involved in some e-mail communication with students, highlighting an increase in accepted forms of communication.

Teaching and Supporting Media

Staff were asked to indicate the teaching media they routinely used (Fig. 1). Additional responses from 2002 were

1. Video
2. Remote database searching (Chemical Database Service) and
3. Computer Aided Learning (CAL) packages.

Clearly, the range of available teaching media has increased dramatically over the last four years with the advent of easy web publishing techniques and new technology. It is also interesting to note the increase in usage of all teaching media, not just the newer technologies, suggesting a greater awareness of how different media can be used most appropriately within teaching. This is undoubtedly related to the move from "didactic" teaching approaches to a more "blended" teaching approach.

Staff were asked to indicate whether they included CAL packages in their teaching (Table V) and, if not, the reason why.

There is a clear shift from staff not using CAL packages to staff using them. Of more concern is the fact that the reasons stated for not using CAL packages have not really changed since 1998.

TABLE I Comparison of staff profile: 1998 with 2002

	Number of staff surveyed	Number of respondents	Response rate (%)
Pharmacy department-1998	40	28	70
School of Pharmacy and Biomolecular Sciences-2002	43	28	65

TABLE III Main use of e-mail by both staff cohorts

	(a) Equally for work and social purposes (%)	(b) For work purposes more than social (%)	(c) For social more than work (%)	(d) I do not routinely use e-mail (%)
1998	11	67	4	18
2002	14	86	0	0
Change	+3	+18	-4	-18

Clear responses from both years indicate that the primary factors were

1. Lack of time
2. Lack of quality
3. Lack of availability of subject-specific CAL packages and
4. Lack of confidence in using the packages.

An additional point noted is that that these packages were perceived as detrimental to the students' progress. Comments such as this appear in response to many of the subsequent questions, indicating a greater awareness of the impact that learning technologies can have on the learning and teaching process.

The Role of IT in Teaching

Staff were asked to what degree they thought IT based activities should supplement or substitute formal lectures (Fig. 2).

The responses indicated a shift towards the middle ground: neither full substitution nor always supplementary. This shows more awareness in what can be achieved using IT-based activities and a new conviction that they can substitute in some cases and supplement in others. The question could be better phrased in the future, as several respondents highlighted the way that the appropriateness of IT can differ between modules:

"I'm not sure I want to indicate any of these answers—[It's] very difficult to generalise and can vary from module to module; some topics may be much better suited to particular electronic resources than others."

Other 2002 responses support this, recognizing areas where IT can make a difference:

"Lecturing should be about providing clarity and focusing on the key/new issues, not a process of providing a lot of data. IT is far more effective and students don't fall asleep."

They additionally recommended

- (1) Doing away with excessive duplication
- (2) Giving more time to academic scholarly activity and
- (3) Presenting learning in an often more attractive form.

But they also recognised its limitations:

"During a lecture you are getting continuous feedback from the students to which you can instantly react, e.g. some point is not being well understood. IT support is invaluable as a backup but tends to be less flexible."

And:

"It cannot replace the direct contact needed for efficient learning and teaching."

This question was further probed by asking staff, if they felt that IT was, in any way a threat to the job of the lecturer (Fig. 3). From the received responses, the majority of staff were still not threatened by the advent of IT into their courses in 2002. The additional responses supported the view that IT can be a very useful and supportive element to learning and teaching and that, to focus such learning, academic and technical expertise will always be needed.

Additional comments also discussed the institution's attitude towards IT and questioned whether it would be used to make additional demands on the lecturer, such as compulsory use of Intranets for lecture material and a justification for increasing student numbers in some courses.

Examples of Good Practice

Staff were asked to give details of specific examples where they felt that IT particularly aided the students' understanding of a specific topic. The number of examples received, coupled with almost

TABLE IV Staff use of e-mail to and from students in 2002

	(a) I have more than 10 students I have had regularly e-mail contact with this year (%)	(b) I have sent and received occasional e-mails from students within the last year (%)	(c) I have not communicated with any students via e-mail this year (%)
2002	50	46	4

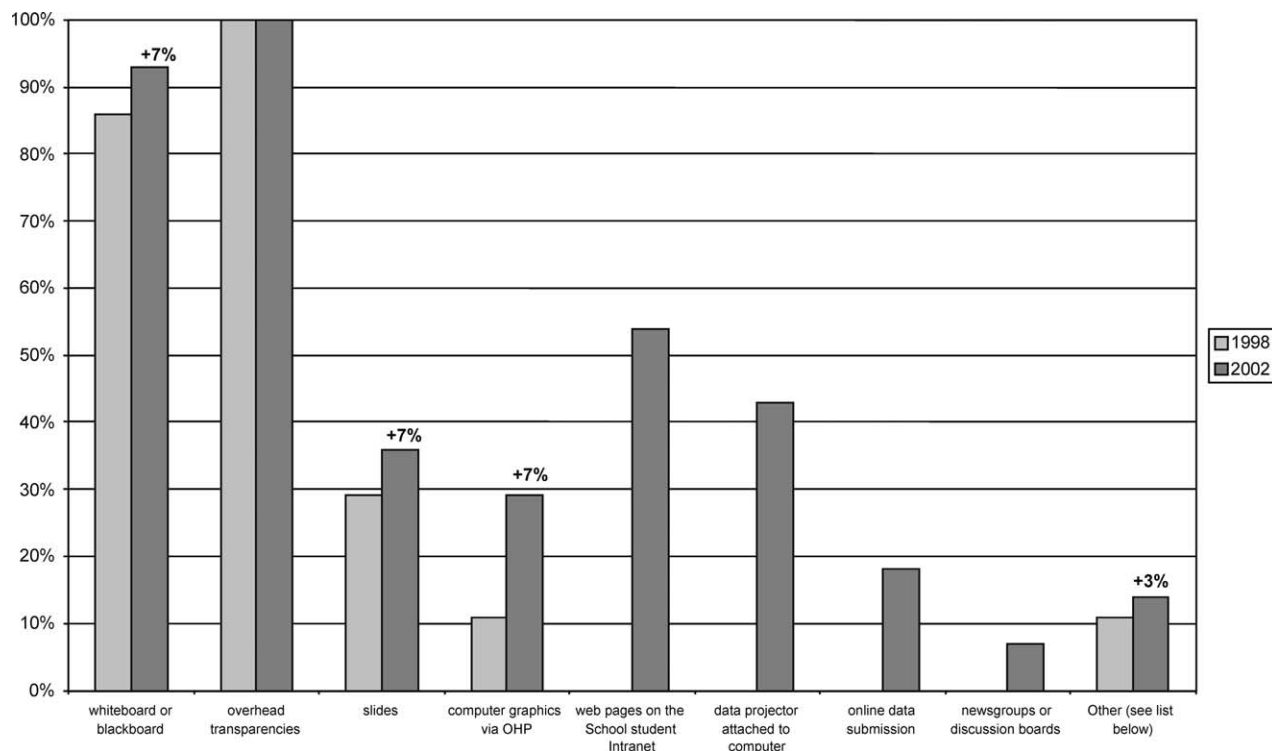


FIGURE 1 Teaching media in use in 1998 and 2002 with percentage changes marked (Media with no percentage change shown were not asked about this in the 1998 questionnaire).

all respondents citing areas where they felt IT particularly aided student’s understanding, shows an apparent understanding among staff of where and how IT can be used most appropriately (Table VI).

Related work within this School has shown a statistically significant improvement of performance

and confidence in practical class students supported by CAL versus traditional resources (Gibbins, 2002).

Intranet Usage

In 1998, staff were asked to comment on the suggestion of an Intranet for Pharmacy students to

TABLE V Staff inclusion of computer aided learning (CAL) in their teaching

	Yes (%)	No (%)	No response (%)	If no, please indicate the reason(s) why you do not suggest that students use a related CAL package:
1998	39	61	0	Sample answers from the 16 received responses: <ul style="list-style-type: none"> • I am not aware of any that are suitable for the material that I teach. If there were, I would use them. • I would rather they read a book. • I prefer human interaction. • Quality of programmes is not good enough • I do not feel confident that I know what is available on student machines or that they are able to access the CAL packages. • I do not know enough about those that are available and I do not have enough time to find out.
2002	61	36	3	Sample answers from the 11 received responses: <ul style="list-style-type: none"> • I have not been able to access them from my office PC in order to assess their suitability. • Lack of confidence that students will be able to access them due to system problems • Don’t know very much about content or availability • There are no CAL packages matching the syllabus. • Just have not had time to set up relevant cal packages • Detrimental to students progress
Change	+22	-25		

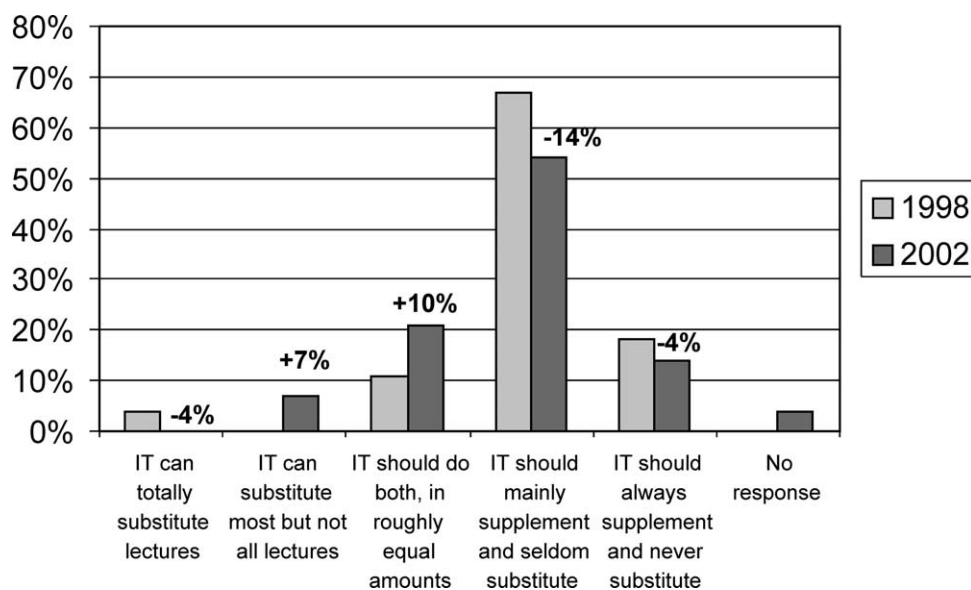


FIGURE 2 Attitudes towards the role of IT in teaching in 1998 and 2002 with percentage changes marked.

access materials. In 2002, a similar question looked at how this development had impacted them (Table VII). The 1998 responses were understandably cautious about the development but also generally accepting of it, thinking the Intranet part of an unstoppable trend. In 2002, there was a much wider array of responses based on experiences in actually working with the Intranet. Positive and negative responses were roughly split evenly, with many staff expressing both positive and negative aspects within their comments. Many of the criticisms concerned the way the Intranet had been used. In areas where staff developed more interactive resources that take real advantage of IT capabilities, such as on-line marking, benefits are clearly seen. Where staff had simply used the Intranet as an on-line repository for existing lecture notes, however, they complained that it was just an administrative burden.

The University is now moving towards a fully supported MLE, making it easy to use a wider range of on-line tools and communication techniques.

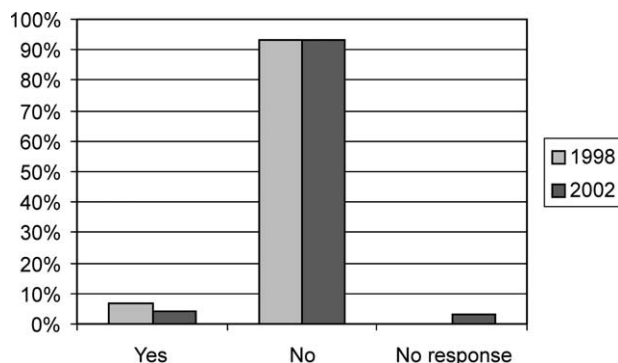


FIGURE 3 Teaching staff attitudes towards whether or not IT constitutes a threat to the job of the lecturer in 1998 and 2002.

This is likely to overcome some of the above resistance and allow greater use of features where IT can really make a positive difference. The University is also making efforts to highlight good practice of the usage of learning technologies across

TABLE VI Selected, specific examples where staff felt that IT particularly aided students' understanding of a particular topic

- Background information, research subject in depth using web of science, develop students interests and enthusiasm, multiple choice questions (MCQs), self tests, supported my teaching
- CAL packages allow students to work in their own time and to repeat exercises they are unsure about.
- Self-assessment packages, graph plotting and data manipulation assignments
- Interactive packages for calculations; animated demonstrations of concepts
- Lecture notes on Intranet are well-liked by the students as they can listen in lectures rather than writing furiously. CAL packages which test the student's ability to actually perform some analysis implant the concepts involved more thoroughly than simply reading or listening
- Q&A databases, simulations, demonstrations, encyclopaedic sites, calculation examples, repeat value of basic lecture material, web-based discussion groups and tutorials/seminars
- CAL-Stereochemistry – this requires good spatial awareness which can best be demonstrated in 3D
- Stereochemistry
- Interactive "virtual" methods have to be developed to simulate the teaching of skills to students.
- Especially good at practical/manipulative simulations and allowing the speeding of long time-course processes
- Spectroscopy – movement of molecules, chemical structures
- 3D representations of biomolecules and chemicals such as those available as pdb structures or Chime renderings
- MCQ feedback testing to std (not assessed) also help std self-diagnose areas of weakness
- Mathematical models/simulations, video-streaming of experimental procedures
- Self learning experience, IT and MCQ at the end of section - check knowledge
- Guided study may be extremely well structured using Intranets/blackboard, e.g. information may be signposted via web links. Facilitates data searching

TABLE VII Selected, specific examples of how the school Intranet impacted upon staff

Positive responses:

- Very popular with students, used and referred to frequently
- On-line submission of coursework/ practicals has made a huge difference to my teaching effort. The students appreciate the speed of marking and feedback increases students understanding of subject prior to formal lectures.
- It has provided a useful platform for integrating existing learning technologies in to course curricula and provides a useful, easily accessible information management resource for students - future development needs to focus on developing more interactive learning.
- It runs parallel to my lectures—all my lectures slides and PowerPoint demonstrations are on it
- I find there is an added pressure to provide complete handouts when not appropriate but overall it is for the benefit of the students.

Negative responses:

- Waste of time and effort and cost students money, and deters book use
- Added to my workload without much benefit to students or me. Development would require considerable technical support.
- Many of the pages are still empty even after three years and a large number a very out of date. I personally use the Intranet to post lecture notes but then the students have to pay to print them out. Reorganisation of the site would be good, as many students have complained that they cannot find the relevant pages for my notes.
- Lectures can be a bit repetitive of Intranet -based material boredom in lectures
- The initial enthusiasm seems to have waned and it looks as though it needs one or more academic/technical staff dedicated to its further development, perhaps, in the case of academic staff, by sabbatical.

the institution to help staff overcome negative attitudes, including statements such as “it is a waste of time” and “it just adds to my workload.”

Support Issues

Staff were asked to consider the support they have had in their learning technology developments and to look at what support they would like from the School or University by ranking the following

options (1 = the most benefit, 4 = the least benefit) (Table VIII):

1. Direct technical support within the school to assist with hardware and software problems
2. Central technical support provided by Information Services to assist with hardware and software problems
3. Direct learning technology support within the school to assist in development of learning technologies and
4. Central learning technology support provided by Information Services to assist in development of learning technologies.

Perhaps unsurprisingly, staff ranked direct technical support and learning technology support more highly than central University support, although this is of course, not always practicable. The School is fortunate in that it has had direct technical support and some learning technology support over the period of this study. In recent years, it has changed the focus of its IT support away from Learning Technologies towards a more general technical support. The establishment of a central learning technologies support group within the University will hopefully address this in the future. Within the school, there are also plans to better utilise administrative staff in the support of learning and teaching in the curriculum.

The Contribution of IT to Learning and Teaching

The final section looked at how, if at all, the Internet and IT in general has contributed to teaching and students' understanding. Staff were asked to give some specific examples of how IT has contributed or how it could potentially contribute to their university work (Table IX).

TABLE VIII Staff cohort preference in 2002 for centralised versus local support mode ranking (mean)

A	B	C	D	Selected comments
1 (1.4)	2 (2.8)	1 (2.3)	4 (3.4)	<ul style="list-style-type: none"> • Assistance needs to be local. When crises occur an immediate response is wanted, having to wait to resolve problems will mean less enthusiasm for adopting the new technologies. • I feel that we receive very little in the way of support or training, apart from for simple problems like network printing. The IT courses available seem to be primarily aimed at the complete beginner or for specialist admin functions. In general, most IT problems seem to be resolved by asking another academic and fixing it as best as possible yourself. • It is unfortunate that a lot of central information is couched in terms inaccessible to the average academic. It is tempting to give up at the first hurdle when faced with paragraphs of acronyms and jargon.

TABLE IX Staff cohort ideas in 2002 for the Internet and how IT has contributed to their teaching and students' understanding

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- I use it frequently to create links to useful sites for the students that are either background or additionally information to lectures; I also use pages with self tests to help students learning; I use Internet as a source of information for research; I also use pictures, etc. from the Intranet to help develop presentations within lectures
 - Communication with students has been facilitated and speeded up. The Intranet has proved useful for providing information in support of lectures.
 - Students' downloading of Intranet notes means that lectures now proceed much more quickly. There is therefore more time to cover difficult aspects of the subject matter and a saving of lecture hours.
 - It has helped provide useful learning support environment for students and particularly assisted those highly motivated but academically weak students in their learning.
-

In 1998, responses focused on the potential of IT, so it was pleasing to hear cases in the 2002 responses where IT had made a positive difference. It was also apparent from the comments that the Intranet is not the important facility but acts as an interface to allow a range of IT tools to be used.

CONCLUSIONS

This study set out to look at the changes in staff attitudes towards learning technologies within the School. The quantitative results show an increase in usage of a range of IT tools within the University and the qualitative responses help to clarify the reasons for these increases. Along with knowledge about the changes that have taken place within the School, we can look at the impact of the solutions proposed in 1998 seeking to overcome the hurdles associated with getting staff engaged with using IT in their medium and long term teaching.

The suggested solutions (1998) and recognized impact (2002) are, first, enhanced staff training and education. With schools moving away from direct learning technology support, there is still a need for more staff training. It is a well-noted phenomenon within the University that academic staff are reluctant to attend formal training sessions and there is evidence that staff respond best to local, one-to-one training, although this has clear resource implications. Notably, the University's move towards a MLE has yielded an academic staff more open to attend training sessions because the training is felt to be more relevant to them.

Secondly, student-driven demand for IT based resources was a suggested solution. Student demand is one of the most prevalent factors in encouraging staff to make use of learning technologies. From the comments received, it is clear that where extensive use is made of the Intranet resources, it is always well received by the students. Staff awareness of

the students' response to these resources is a major factor in changing their own attitudes towards using them. Another major factor, however, includes highlighting student reluctance to make use of library resources when all relevant links to materials are presented to them on-line.

A third proposed solution was "efficiency realisation." The authors had anticipated that as staff got past the initial hurdle of posting learning support materials on the Intranet, they would discover that this actually allowed them to use lectures more efficiently and provided an "archive" resource for students to save time previously spent distributing lost copies of notes, timetables, etc. Many of the 2002 comments supported this theory and as more time goes by—and the initial investment of creating and posting electronic versions of materials is forgotten—time can be spent refining and improving the on-line materials, making use of the academic teaching skills and knowledge while being less concerned with the technical skills required and more "administrative roles" in the academics.

The fourth and final suggested solution was a uniformity of hardware and a development of cross-platform resources. The school's move to an Intranet and primarily PC-based environment has certainly had an impact. Compared to the 1998 responses, there were no comments in 2002 regarding the difficulty of sharing information with other staff within the school and problems accessing the Internet. The issues highlighted in the latter study had much more to do with pedagogical aspects of teaching, not technical barriers.

The primary conclusions drawn from the study identify the changes seen in the responding staff:

1. There is a greater understanding of the benefits and drawbacks of using IT in teaching.
2. There is a greater understanding of where IT can be used most appropriately in teaching.
3. There is less emphasis on technical and computing barriers.
4. There are still time, support and training resource issues that need addressing within the school.

It is not necessarily the aim within the School to have all staff using a wide range of L&T technologies in their teaching but more to make sure all staff are aware of how they could use such technologies for that purpose. This study affirms that the School is certainly moving in this direction, perhaps more quickly than would have been expected. Suggested solutions to ensure that all staff are indeed aware of these technologies now focus on pedagogical aspects:

1. To disseminate good practice of use of learning technologies within the Institution and within

the School to make sure all staff are aware of what their colleagues are doing and what they could be doing.

2. To focus on areas where IT can be clearly seen to make a positive difference within learning and teaching and allow staff in these areas to maximize the effectiveness of their on-line resources.
3. To provide one-to-one training and support for staff wherever possible, to meet individual needs.

Future Work

A study is currently in progress to compare these results with all other schools across the University of Brighton. This should allow conclusions to be drawn concerning whether attitudes at the School of Pharmacy are similar to the wider University or if the particular research interests of the School have affected the attitudes of its staff in a unique way.

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APPENDIX A: 1998 QUESTIONNAIRE**Pharmacy Staff IT Questionnaire**

Colleagues – as apart of the School continuing IT strategy and drive toward quality enhancement, we kindly ask you to complete the following questionnaire. Once completed it can be put into my post tray at your convenience. The latest day that it would be of use is Friday August 15th. This questionnaire is totally anonymous; you cannot be identified from its contents. I thank you most kindly for your help in this matter

Protocol:

Please ring the number corresponding to your answer like this [a], and/or write you answer in the space provided.

Part One: About You

- (1) Before starting your lecturing career at the University of Brighton, what was your occupation?
- [a] Lecturing elsewhere
 [b] Postdoctoral fellowship
 [c] Ph.D. studentship
 [d] Other pharmacy-related employment [please specify]
 [e] Other employment [please specify]
- (2) To what age bracket do you belong?
 [a] 25-35 [b] 36-40 [c] 41-45 [d] 46-50 [e] 51+
- (3) For how many years have you been a lecturer?
 [a] 1-3 [b] 4-6 [c] 7-9 [d] 10-12 [e] 13+
- (4) In how many other Higher Educational or research establishments have you worked [Include postdoctoral but not Ph.D. studies]
 Answer: _____

Part Two: Computer Usage:

- (5) Do you use e-mail? [Do not include internal Microsoft Mail] YES/NO
 [if YES, go onto to Q6, if No go on to Q7]
- (6) Where you have circled YES for Q5, please indicate the main use to which you put e-mail:
- [a] Equally for work and social purposes
 [b] For work purposes more than social
 [c] For social more than work
- (7) Please indicate the computer platform you prefer:
- [a] I only ever use Macintosh and am unable to use PC format
 [b] I usually use Macintosh but am able to use PC format
 [c] I can use either Macintosh or PC format equally well
 [d] I usually use PC format but am able to use Macintosh
 [e] I only ever use PC format and am unable to use Macintosh
- (8) Please indicate what teaching media you routinely use [ring as many as are appropriate]
- [a] Whiteboard/blackboard
 [b] Overhead transparencies
 [c] Slides
 [d] Computer graphics via OHP
 [e] Other (specify)

- (9) In your lectures, do you suggest that students use a related CAL package?
YES/NO

If you answered YES to Q9 go on to Q11, if you answered NO go on to Q10

- (10) If you answered No to Q8, please indicate the reason(s) why you do not suggest that students use a related CAL package:

- (11) To what degree do you think IT based activities should SUPPLEMENT formal lectures or SUBSTITUTE them?

- [a] IT can totally substitute lectures
- [b] IT can substitute most but not all lectures
- [c] IT should do both, in roughly equal amounts
- [d] IT should mainly supplement and seldom substitute
- [e] IT should always supplement and never substitute

Please write a sentence to explain your answer to Q11:

- (11) Do you feel that IT is in any way a threat to the job of the lecturer? YES/NO
Please elaborate on your answer:
- (12) Some books are now being sold with an accompanying CD-ROM. What do you think about this development?
- (13) Give details of *specific* examples where you feel that IT [i.e. any computer-related item(s)] can aid the students' understanding of a particular topic:
- (14) One of the Pharmaceutical Chemistry practical sessions involved the students carrying out a CAL package on stereochemistry. For the courses that you teach, please comment on the potential effectiveness of this approach to the students' understanding and learning the topic:
- (15) One suggestion for the Department is for every module to have its own page on the Pharmacy WWW site, and that material relevant to the module would be posted on the page. The module page would be inaccessible from outside. The page might include [but wouldn't be restricted to] links to relevant sites, notes, questions and references. Comment on your attitude toward this potential development:
- (16) One recent development in the University is a course in another faculty which is entirely self-taught by the students. The students access a site on the World Wide Web. The site guides the students to notes, links, tutorials and other study material. The only contacts with teaching staff are two meetings per semester. Please give your opinion on this type of approach to teaching, and its possible relevance to your course/modules:
- (17) The main aim of this questionnaire is to find out how, if at all, the Internet and IT in general has contributed to your teaching and the students' understanding. In the space below please give some *specific* examples of how it has contributed to your university work, or how you feel that it potentially could:

Thank you for completing the questionnaire.

APPENDIX B: 2002 QUESTIONNAIRE

School of Pharmacy and Biomolecular Sciences
Academic Staff Questionnaire

In order to review the development of staff attitudes to the use of learning technologies, I would like you to complete the following questionnaire before the end of June. This questionnaire will act as a direct comparison with the questionnaire you may have completed in 1999. This questionnaire is totally anonymous; unless you choose to leave your details for follow-up questioning.

Thank you,

1. For how many years have you been a lecturer?

- 1-3 4-6 7-9 10-12 13+

2. Please indicate the main use to which you put e-mail

- equally for work and social purposes

- for work purposes more than social

- for social more than work

- I do not routinely use email

3. Do you have regular email contact with your students?

- yes, I have more than 10 students I have had regularly email contact with this year

- I have sent and received occasional emails from students within the last year

- no, I have not communicated with any students via email this year

4. Please indicate what teaching media you routinely use (select as many as are appropriate)

- whiteboard/blackboard

- overhead transparencies

- slides

- computer graphics via OHP

- web pages on the School student Intranet

- data projector attached to computer/laptop

- on-line data submission

- newsgroups/discussion boards

other (please specify)

5. In your lectures, do you suggest that students use a related Computer Aided Learning (CAL) package?

- yes no

if no, please indicate the reason(s) why you do not suggest that students use a related CAL package:

6. To what degree do you think IT based activities should *supplement* formal lectures or *substitute* them?

- IT can totally substitute lectures

- IT can substitute most but not all lectures

- IT should do both, in roughly equal amounts

- IT should mainly supplement and seldom substitute

- IT should always supplement and never substitute

Please expand on your answer (optional):

7. Do you feel that IT is in any way a threat to the job of the lecturer?

yes no

Please elaborate your answer (optional):

8. Give details of specific examples where you feel that IT (i.e. any computer-based resource) can aid the students' understanding of a particular topic:

9. The School of Pharmacy and Biomolecular Sciences Student Intranet has been running in its current form for over 3 years. How do you feel this has impacted your learning and teaching? And how would you like to see this kind of resource developed?

10. Considering the support you have had in your learning technology developments and looking at what support you would like from the School or University, please rank the following types of support in terms of what you think would benefit *you* most (1 =most benefit, 4 = least benefit).

- direct technical support within the school to assist with hardware and software problems
- central technical support provided by Information Services to assist with hardware and software problems
- direct learning technology support within the school to assist in development of learning technologies
- central learning technology support provided by Information Services to assist in development of learning technologies

Please add any further comments you have on learning technology support:

11. The main aim of this questionnaire is to find out how, if at all, the Internet and IT in general has contributed to your teaching and the students' understanding. In the space below please give some specific examples of how it has contributed to your university work, or how you feel that it potentially could:

Thank you for completing the questionnaire.

Journal: GPHE
Article no.: 31019

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If discrepancies were noted between the literature list and the text references, the following may apply:

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 Uncited references: This section comprises references which occur in the reference list but not in the body of the text. Please position each reference in the text or, alternatively, delete it. Any reference not dealt with will be retained in this section.

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	Kindly check the table numbers.	
	In Appendix A, please check the numbering of questions (No. 11 is repeated twice).	