IN BRIEF

- There appears to be a need for innovative teaching and learning in undergraduate dental education.
- Increased accountability demanded by government, an emphasis on research rather than on teaching and large workloads amongst academic dentists may create barriers to innovation.
- Such barriers may also have their roots in the culture and structure of the dental school itself.
- A 'learning organisation' approach to undergraduate education, characterised by an openness of discourse, a culture that encourages networking, dialogue, exchange and feedback, may eliminate some of the barriers to innovative teaching.
- The agents of change — the school, the department, the individual academic, each have their role to play in facilitating innovation in teaching.
- A systems approach such as the Progress File Learning System has the potential to encourage collaboration between the agents of change, by providing a structure and a forum for communication and dialogue and to build a 'learning community'.

Developing teaching and learning innovations in dental training: the example of the Progress File Learning System

B. Pee,¹ T. Woodman² and E. S. Davenport³

There is a need for developing teaching and learning throughout Higher Education (HE), not least in dentistry. The aims of this paper are to examine dental schools, departments and individual academics as agents of change, to consider barriers to innovation and explore whether funding structures may inadvertently undermine the innovative process. A 'Progress File Learning System' (PFLS), was developed and introduced at one UK dental school to support such innovation. This was guided by previous work involving four UK dental schools aimed at developing progress files for the dental team. A 'learning organisation' approach is suggested as a way of improving teaching and learning in dental training.

WHY INNOVATE DENTAL TEACHING?

There are important reasons for developing teaching practice in HE, including dental education, not least to improve the quality of learning outcomes through reflective practice.^{1,2} Research³ has generally shown that it is the behaviour of lecturers and the way they design courses that facilitates deep learning rather than the essential characteristics of individual students.⁴ However, the general consensus has been that research, so far, has made little difference to teaching in HE.³ Large-scale lectures remain a common form of teaching despite increasing evi-

dence that student-centred approaches, aimed at encouraging deep learning, including problem-based;⁵ self-directed⁶ and reflective⁷ learning have been successfully introduced. It makes sense that, at a time when evidence-based clinical practice is pivotal in dentistry, such rigour should be extended to teaching⁸ as the medium by which the profession is engendered. Educators should be aware of quality implications for the dental profession of employing outdated and partially effective teaching methods. They need to beware of inducting newcomers and part-time academics into outdated approaches and should consider the effects on job satisfaction.⁹ Furthermore, teachers increasingly need to consider student expectations with regard to standards and methods of teaching. Today's dental students may well have experienced 'learner-centred' methods in schools¹⁰ and find more passive methods of learning such as lectures de-motivating. They may be caused to abandon their deep approach to learning in favour of a surface approach.^{11,3}

Having briefly considered why teaching innovation is called for in dental education, the following questions arise:

- What are the barriers to teaching innovation in dental schools?
- What conditions facilitate teaching innovation?

To address these, the roles played by institutions, departments and academics in bringing about teaching reform as recommended by government and professional bodies are explored below but firstly the concept of a 'learning organisation' must be introduced.

'Learning organisations' and 'organisational learning' are concepts derived and popularised outside of HE.^{12,13} The hallmark of a learning organisation is an openness of discourse taking place in a culture that encourages networking, dialogue, exchange and feedback.¹⁴ It is an organisation that embraces change in accordance with the needs of its members, all of whom share information and learn from each other. Teachers and managers are considered no less learners than students them-

¹Research Co-ordinator, ²Research Assistant, ³Professor of Dental Education, Department of Oral Growth and Development, Barts and the London, Queen Mary's School of Medicine and Dentistry, University of London, UK
Correspondence to: Dr E. S. Davenport, Professor of Dental Education, Paediatric Dentistry, Barts and the London, Queen Mary's School of Medicine and Dentistry, Turner Street E1 2AD
E-mail: E.S.Davenport@qmul.ac.uk

Refereed Paper

Received 27.08.02; Accepted 14.02.03

doi:10.1038/sj.bdj.4810602

© British Dental Journal 2003; 195: 463–466

selves. 'Organisational learning' takes place when the learning experiences of these individuals and groups become incrementally embedded in organisational memory.¹⁵

THE DENTAL SCHOOL AS AN AGENT OF CHANGE

Teaching innovation and reform thrive in learning organisations as described above and there is evidence that this approach to education has been responsible for improving, even 'turning around', schools.¹⁶ However, many dental schools may not currently fit the description of 'learning organization' for reasons including a lack of egalitarian (democratic) culture, a limited definition of who 'the learner' is and a dominance of teacher-centred approaches to learning. The tendency in dentistry is to use rationalist curriculum planning focusing on targets and observable outcomes, competency-based training, assessment and benchmarking, which often leads to traditional, didactic teaching involving uni-directional flow of information and students who remain relatively passive. There may also be a lack of communication within the schools' systems and hierarchy that makes rationally constructed, top down reform in particular, difficult to implement.¹⁷ It should be borne in mind that whilst teams, work-groups and departments form the core work units for academics in HE, it is within these 'communities of practice'¹⁸ that teaching reform and innovation has to be accepted. These communities are often more or less self-regulating within a pecking order and effective communication between them may be absent.

DEPARTMENTS AS AGENTS OF CHANGE

Departments are important in initiating and implementing change,^{19,20} not only because academics have strong allegiances to their disciplines (which often outweigh their loyalty to the university),²¹ but because their members share, often tacit, customs, conventions and standard practices that form 'best practice' from their perspective.¹⁵ Specifically: *'University departments develop ways of thinking about their students, approaches to course design, and implementation, assessment practices and use of technologies which become invisible to members of those departments but which can seem odd, novel, exciting, or just plain wrong to others. Underpinning these practices are values, attitudes and ideologies that are partly developed and communicated locally.'*²⁰

Thus the characteristics of departments, amongst which leadership may be salient, are likely to be important deter-

minants in the reform of teaching. Departmental leadership emphasizing control, command and strict hierarchy is less conducive to implementing change than 'interactional' leadership emphasizing collegiality and teamwork, suggesting that what learning organizations require is learning managers: *'who are reflective practitioners and who apply their analytical skills to the important activity systems with which they are engaged, and develop with other staff, appropriate, contextualised strategies for change'*.¹⁹ Departmental heads must also be 'tuned in' to staff's expectations, opinions, reactions, motivations and interactions, so that, once made, changes do not simply fade away leaving practices and structures to revert, over time, to the way they were before.¹³ These are tall orders for heads who tend to be untrained in leadership and act by default, highlighting a need for appropriate staff development.

ACADEMICS AS AGENTS OF CHANGE

The importance of the individual academic in the change process has been recognised, as it is they who ultimately carry out teaching innovation and reform.²² However, given current realities in HE, many such are likely to conclude that teaching innovation is not an option, or at least not a priority, for them at present. In the face of mounting workloads, stress levels amongst academics are high.²³ Lack of engagement with teaching innovation may be one way of curbing workload, in the short-term at least, in order to cope. Other sources of stress impinging upon motivation to innovate may be teachers' perceived lack of control over

their job,²³ eroding academic freedom resulting from increasing accountability imposed by government²⁴ and lack of opportunity to form relationships with students.⁹ Another reason why teachers may not welcome teaching innovation is that their professional self-image is bound up with current practice as an expert practitioner.²⁵ Rationalisations such as 'well tried is best' or the recognition of personal limitations may hinder such engagement. Last but not least, academics may experience role conflict in relation to their multiple professional roles and responsibilities²⁶ and be forced to adjust their priorities. In this regard, a recent survey of UK academic dentists²⁷ has highlighted the difficulties they face in attempting to balance the competing demands of service work, research and teaching. It revealed that, although the opportunity to teach was a major incentive for pursuing an academic career, many respondents nevertheless wanted to spend more time on research and less on teaching. These findings are in line with the notion, widely accepted in HE²⁸ that research benefits the career whilst teaching does not. It has now been widely recognised that HE reform and changes in funding structure since the late 1980s, putting great importance onto research at the cost of teaching, have created the divide between teaching and research²⁹ and by implication, eroded motivation amongst career-minded academics to innovate their teaching. Thus it may be that the most important barrier to innovation and reform in teaching is, inadvertently, created by government's own policies.

Fig. 1 Components of the Progress File as they fit into the dental curriculum

BECOMING A 'LEARNING ORGANISATION'

The power to implement change in dental schools resides in the collective engagement, not the individual agent alone. The three agents of change (schools, departments and individuals) acting alone cannot ensure that teaching innovation occurs; rather schools need to become learning organisations. For this to happen a holistic systems approach, collaboration, sharing of good practice and teamwork that stimulates and motivates individuals with in-built quality control is indicated. Academics undertaking teaching reform need to be supported and barriers openly addressed in order to bring solutions and fuel creativity. It is not helpful to turn a blind eye to these or to cite individual teachers' lack of initiative, on the grounds that admitting all is not well might affect school quality ratings. The multiple, usually tacit, expectations on teachers to deliver, combined with lack of feedback, can breed unease and uncertainty that must be addressed: teachers struggling to access scarce funding to meet requirements and secure personal professional development is not conducive to innovation nor does it encourage the building of a learning organisation.

THE WAY FORWARD

Academics need recognition for the work they do, a reasonable workload and a fair reward system. Steps are being taken to redress the balance between teaching and research by introducing teaching qualifications that are set to count toward professional development²⁸ and by providing incentives, locally, for promotion on the basis of teaching excellence.³⁰ However, it is the funding councils that seem ultimately to hold the key to levelling the playing field for teaching.²⁹ It has been suggested that in order to bring to the improvement of teaching more of the creativity and rigour that academics bring to their research,^{31,32} funding should be made available for those who hold a special interest in education. Such funding and accreditation of teaching innovation would ensure that time devoted to educational research and development did not disadvantage academic careers. Teachers would be able to carry out, and reap the benefits of action research in their own teaching/learning environments, an approach that has been employed in curricular development in schools and is widely accepted as a model for change in courses and teaching.³³ Appropriate staff development would enable teachers to go beyond routine evaluation of teaching³⁴ and the rigorous use of social science methods, tools and concepts, including theory to underpin research,²² would help to ensure sustainable, ongoing development.

Table 1 Pre-requisites for accommodating teaching innovation

- Funding for action research
- Staff development for action research
- Accreditation of teaching (ITL)
- Pro-active teachers
- Interactive leadership
- Staff development in leadership
- Emphasis on team working and collaboration
- Locally developed tools/ systems

Table 1 depicts the conditions under which teaching innovation/reform might thrive in HE/dentistry.

Given current realities in dental education, such a proposal may appear somewhat futuristic. Until additional funding for education innovation is forthcoming, it is up to heads of schools and departments to provide the incentive to innovate. One immediate, pragmatic solution might be to introduce locally developed or ready-made teaching support and development tools, of which a number have already been explored and implemented in universities.³⁰ One system, used in a UK dental school, is introduced in Figure 1. It is linked to the school's dental undergraduate progress file as outlined in this diagram.

THE PROGRESS FILE LEARNING SYSTEM (PFLS)

A progress file for dental undergraduates,¹ was developed by educational researchers within the dental school through an iterative process of consultation, trial and appraisal involving students and teachers. As it was integrated into the curriculum, the initial simple concept of a more or less stand alone student Progress File, evolved (on the basis of teacher feedback) into a comprehensive learning and teaching system (PFLS), also supporting teachers to be innovative in their teaching (Fig. 2). To this end it includes a system for personal audit and teaching materials for a number of student-centred, reflective and interactive learning activities. These can be used off the peg (attractive in the face of large workloads) but are also eminently adaptable and variable to encompass teachers' own ideas and requirements. The opportunities for learning afforded by the teacher resources in the PFLS engage users in reflection on teaching, learning and the curriculum in the spirit of lifelong learning and quality assurance as illustrated in Figure 1. Placed at the centre of dental training (Fig. 3), the PFLS can provide the information, tools and stimulus for individuals to enhance their teaching and share good practice as members of a 'learning organisation'.

Fig. 2 Components of the tutor resource

CONCLUSION

Dental schools must address lack of teaching innovation and look to the causes, which may include tradition, unfavourable leadership, excessive workloads and non-rewarding funding structures. Whilst lobbying government for change on the latter two of these, schools must also be creative in their search for local incentives for teaching innovation. Ultimately, a 'learning organisation' approach is called for but this may take time to develop and embed. Meanwhile the use of teaching support and development tools such as PFLS may be helpful on several fronts:

- Dental schools need to create the conditions that encourage teaching innovation through facilitating reflection, networking, communication and open discourse. Tools such as PFLS could provide a framework for doing this.
- Departments must provide effective leadership and set specific goals for teaching and learning innovation. Staff development for heads may be indicated. Meanwhile PFLS-type tools could provide guidance and operate as local reward systems acknowledging excellence in teaching.
- It is the individual academic who actually carries out teaching innovation and reform by being creative, reflective and self-appraising, continuously evaluating and recalibrating their own performance

and practice. The support provided by tools such as PFLS can help with 'getting started' and maintaining momentum in these processes.

- These three agents of change are mutually dependent. Each relies upon the other to 'pave the way' for achieving their common goal of excellence in teaching and each must do their part to facilitate the other. Using a conjoint forum or system such as the PFLS will help to ensure that each agent of change contributes toward achieving this goal.

1. National Committee of Inquiry into Higher Education. *Higher education in the learning society*. London: HMSO, 1997.
2. General Dental Council. *Lifelong learning: taking dentistry forward*. London: GDC, 2000.
3. Gibbs G. *Improving the quality of student learning*. Bristol: Technical and Educational Services Ltd, 1992.
4. Ramsden P. Using research on student learning to enhance educational quality. In Gibbs G. (Ed) *Improving student learning: theory and practice*. pp20-31 Oxford: Oxford Centre for Staff Development, 1994.
5. Albanese MA, Mitchell S. Problem-based learning: a review of the literature on its outcomes and implementation issues. *Acad Med* 1993; **68**: 52-81.
6. Fry H, Jones A. Self-directed learning in the undergraduate dental curriculum. *Br Dent J* 1995; **197**: 373-376.
7. Wong, F K Y Kember D, Chung L Y F, Yan L. Assessing the level of student reflection from reflective journals. *J Adv Nurs* 1995; **22**: 48-57.
8. Lubin J, Prosser M. *Implications of recent research on student learning for institutional practices of evaluation of teaching*. Warwick: Improving Student Learning Symposium, 1993.
9. Hargraves A. The emotional practice of teaching.

10. Clayton B. Education and the quality of care. *Br Dent J* 1994; **24**: 221-225.
11. Marton F, Saljo R. On qualitative differences in learning: 1. Outcome and Process. *Br J Educ Psychol* 1976; **46**: 4-11.
12. Senge P. *Schools that learn*. London: Nicholas Brealey 2000.
13. Argyris C, Schon D A. *Organisational learning: A theory in action perspective*. Reading: M A Addison-Wesley, 1974.
14. Brown J S, Duguid P. *The social life of information*. Cambridge, MA: Harvard University Press, 2000.
15. Sumner T, Domingue J, Zdrahal Z, Hatala M *et al*. *Enriching representation of work to support organisational learning*. Milton Keynes: Knowledge Media Institute, The Open University, 1998. <http://kmi.open.ac.uk/projects/enrich/enrich-oms98-paper.html>
16. Senge P, Kleiner A, Roberts C, Ross R, Roth G, Smith B. *The dance of change: the challenge of sustaining momentum in learning organisations*. New York: Doubleday-Currency, 1999.
17. Fullan M. *Change forces: the sequel*. London: Falmer Press, 1999.
18. Trowler P R, Knight K T. *Exploring the implementation gap: theory and practices in change innovations*. In Trowler P R. (ed.) *Higher Education policy and institutional change: intention and outcomes in turbulent environments*. Buckingham: Society for Research into Higher Education and Open University Press, 2001.
19. Knight P T, Trowler P R. Department-level cultures and the improvement of teaching and learning. *Stud Higher Educ* 2000; **25**: 69-83.
20. Trowler P R, Knight P T. Coming to know in higher education: theorising faculty entry to new work contexts. *Higher Educ Res Devel* 2000; **19**: 27-42.
21. Altbach P G, Lewis L S. The academic profession in international perspective. In Altbach P G. (ed) *The international academic profession* pp3-48. Princeton, NJ: The Carnegie Foundation for the advancement in Teaching, 1996.
22. Gibbs G. Changing lecturer's conception of teaching and learning through action research. In Brews A. (ed.) *Directions in staff development*. Buckingham: The Society for Research into Higher Education and Open University Press, 1995.
23. Fisher S. *Stress in academic life: the mental assembly line*. Buckingham: The Society for Research into Higher Education and Open University Press, 1994.
24. Brown S, Holmes A. *Quality audit issues*. In Holmes A, Brown S. (eds) *Internal audit in higher education*. pp3-7. London: Kogan Page, 2000.
25. Dreyfus H, Dreyfus S. (eds) *Mind over machine*. Oxford: Blackwell, 1986.
26. Abouserie R. Stress, coping strategies and job satisfaction in university academic staff. *Educ Psych* 1996; **16**: 49-56.
27. Goldacre M, Lee P, Stear S, Sidebottom E, Richards R. Views of academic dentists about careers in academic dentistry in the United Kingdom. *Br Dent J* 2000; **188**: 154-159.
28. Palastanga N. Promotion for excellence in teaching: is there a glass ceiling? *ILT Newsletter* 2002; **7** Winter.
29. Elton L. *Effect of funding council policies on teaching quality*. In Smith B, Brown S. *Research teaching and learning in higher education*. pp 40-46. London: Kogan Page, 1995.
30. Hicks O. Ensuring Teaching Quality (ETQ), best practice pathways: a focus on departmental practices for good teaching and learning. In Holmes A, Brown S. (eds) *Internal audit in higher education*. pp119-130. London: Kogan Page, 2000.
31. Elton L. Research, teaching and scholarship in an expanding higher education system. *Higher Educ Quart* 1992; **46**: 252-268.
32. Healey M. Developing the scholarship of teaching in higher education: a discipline-based approach. *Higher Educ Res Develop* 2000; **19**: 169-189.
33. Stenhouse L. *An introduction to curriculum research and development*. London: Heinemann, 1975.
34. Ramsden P, Moses I. Associations between research and teaching in Australian higher education. *Higher Educ* 1992; **23**: 273-295.

Figure 3. The Progress File at the centre of learning