



Review article

Leadership in dental education

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ABSTRACT

Dental school education continues to evolve at a significant pace. The challenge for those in leadership positions in dental education is to deliver a curriculum which is contemporary, evidence-based, and at the same time meeting the expectations of regulators and the established dental workforce – the latter being professional colleagues, including employers of future graduates. An important change in recent years is the acceptance that dental education itself is no longer a ‘start-stop process’, beginning at entry to dental school and concluding at graduation. Rather, dental education should be viewed as a continuous and life-long continuum. Perhaps one of the greatest attributes we can develop in our students is the desire and ability to seek to update, refresh and develop their knowledge and skills in the ever-advancing world of dental practice.

1. Introduction

“Everything flows and nothing stays” is a quotation attributed to the Greek philosopher Heraclitus, which is often presented as “*There is nothing more constant than change*”. This is certainly true for those of us involved in dental education, where advances in clinical treatments, technologies, disease patterns, patient expectations and increased understanding of molecular biology and dental biomaterials have driven changes in teaching and education in recent years. However, accompanying this, there have been significant changes in approaches to education for adult learners, including dental students, advances in assessment, particularly in the clinical setting, as well as the changing nature and expectations of our students, who are very different to those of a decade or two ago [1]. Leadership in dental education must be cognisant of all relevant advances, changes and trends and, to be effective, needs to encourage and motivate those delivering educational programmes to accept, adopt an apply modern thinking and approaches, while responding to student feedback, and educational outcomes and assessments

2. Design and delivery of dental school curricula

2.1. Curriculum content

A basic question remains – what should we teach our dental students? Dental school curricula have evolved in recent years, including

an increased emphasis on the teaching of relevant molecular biology of dental tissues in development, health and disease, as well as an increased emphasis and understanding of systemic diseases and the role of the dentist in the prevention, diagnosis and management of systemic diseases. Such developments are sometimes challenged as their inclusion in the dental school programme can lead to loss of time elsewhere, including clinical activity. However, such teaching is necessary to stimulate and encourage scientific thought amongst new graduates which will, in time, lead to the development of new ideas, treatments and techniques. The discoveries of tomorrow cannot happen in dentistry unless we equip new cohorts of dentists with the necessary skills.

However, other common dilemmas in dental education include decisions on caries management, choices of restorative materials for the contemporary restoration of teeth, teaching of new technologies and the continued teaching of certain treatments which are increasingly-regarded as “dated”. Such decisions may challenge established practising arrangements. To consider these areas further, some of the challenges include:

- Well-recognised research findings from the late-1990s have demonstrated that it is not always necessary to **remove caries**, rather it can be “sealed” in place with a good quality restoration. [2]. Despite this, many schools teach their students to render cavities caries-free prior to restoration [3].
- A more recent dilemma has been the emergence of **minimally invasive dentistry techniques** and, in particular, the predictable use

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of resin composite for the restoration of load-bearing cavities in posterior teeth. As recently as 20 years ago, fewer than 1-in-10 dental school graduates gained clinical experience in the placement of posterior resin composites [4]. Since then, resin composite has been adopted as the ‘material of choice’ for the restoration of posterior teeth [5] and recent evidence suggests that in the UK and Ireland, at least, dental students place twice as many posterior resin composites while at dental school, compared to amalgam [5]. Similar dilemmas exist in relation to the teaching of repair of existing restorations which, despite featuring signs of deterioration and degradation, remain serviceable [6,7].

- Similar dilemmas exist in relation to the teaching of new technologies such as rotary endodontic instruments and digital workflow. Should we teach our students both ‘traditional’ and ‘novel’ techniques? Evidence would suggest that so-called ‘novel’ techniques are appropriate, but if a skills mismatch exists between new graduates and established practitioners, then new graduates may struggle to achieve employment, while established practitioners may well complain that new graduates are no longer “as good as they used to be” [8].

Related to this, it should also be remembered that vast amounts of information are now available to our students – in scientific papers, textbooks and various resources on the internet – much more so than in the past. Developing critical analysis and appraisal skills within our students is also very relevant to enable our students to process, and make appropriate decisions and choices, based on newly-emerging information.

2.2. Contemporary models of delivering dental school education

Leaders in dental education face many challenges, not least the requirement to train dental students to be “fit for purpose” on graduation. In addition to the expectations of a ‘traditional’ university programme of study, dental schools must also satisfy the expectations of the relevant regulatory/ licensing body. In the UK, the General Dental Council regulates the practice of dentistry and it expects dental students, on graduation, to be a “safe beginner” and pose no harm to patients. The transition from the traditional, increasingly regarded as ‘artificial’ environment of a dental school, to the independent practice of dentistry, even in countries in which Dental Foundation Training exists, is fraught with challenges. Traditionally, dental students undertook patient management within the environment of a dental school, where under supervision they completed clinical tasks and exercises, with a focus on requirements and quotas of items of treatment. While helpful in the earlier development of dental students, such environments are no longer regarded as representative of the environment in which the graduated dentist will operate. In response to these challenges, community-based clinical teaching programmes (sometimes termed ‘outreach dental teaching’) began to develop internationally [9]. In most UK dental schools dental students and student dental care professionals learn and develop skills together in primary care settings, during a large part of their clinical instruction [10]. Many millions of pounds have been spent in establishing such outreach teaching clinics, by universities (and in the UK by the NHS); however, it is suggested that this investment is of good value. Contemporary evidence emphasises the positive effect of this form of teaching on student confidence, both of current and graduated students [11,12]. Now-graduated students have reported many positive features of this form of teaching including the availability of a suitably trained dental nurse for all procedures, ready access to helpful, approachable teaching staff, and a positive working atmosphere [12]. This resonates with the desire to create a dental team within a suitable environment. It is also possible to develop such teaching in “in-reach” (i.e. within the existing dental school) rather than “outreach” centres should circumstances demand this. Such developments have necessitated flexible, evolving approaches in

leadership and management. To best equip future leaders in dental education, relevant training should include instruction in leadership. There is little value in producing educators who lack the necessary skills and know to implement and lead change in the educational environment.

3. Challenges to delivering modern evidence-based dental school curricula

Many, different challenges exist in leading and delivering high quality dental school programmes, not least the traditional challenges of funding and the management of increasingly aging buildings and facilities. Some specific challenges include:

- Recruitment of patients
- Managing the expectations of established practitioners
- Employer/ university pressures

Recruitment of the “right patient at the right time for the right student” has always presented challenges, not least for dental schools based in traditional city centre locations where population density has fallen and the remaining population has either aged or become more transient. Clearly, it is the range of exposure which a student receives during their training which is significant. At some points students, particularly novice students, will benefit from long-standing patients of the hospital and who require little treatment other than periodontal maintenance with or without maintenance or replacement of existing restorations or prostheses. However, at other times students greatly benefit from exposure to the management of patients with significant dental disease. This can be a challenge for some dental schools given local catchment area demographics and referral protocols. It can, however, be addressed via the development of outreach teaching as described above. Also, consideration needs to be given to developing novel teaching aids and strategies, such as the development of simulation suites and repositories of virtual patients with varied medical and dental histories for case-based discussions. While not as ideal as clinical experience, sophisticated alternatives to natural teeth and supporting structures now exist to allow the acquisition of clinical skills in endodontics, exodontia and minor oral surgery, amongst other procedures.

Managing the expectations of established practitioners – many of whom graduated 20+ years previously - has always been a challenge. Many established practitioners will seek new employees (graduates) who will “fit in” with existing practising arrangements and remuneration schemes [13]. A typical example of such relates to the selection of amalgam, rather than resin composite for minimally invasive restoration of posterior teeth. Evidence from North America and the UK suggests that many established practitioners prefer amalgam, albeit in the UK this is linked to the NHS funding schemes, yet most new graduates now have much greater experience in the placement of posterior resin composites [14–16]. The current approach towards increased placement of posterior composites is based on contemporary research forming part of a substantial evidence base. However, tension and conflict occur in this situation. Dental schools, specifically those responsible for curriculum development and delivery must show strong leadership in this area – otherwise the practice of dentistry will never evolve!

Pressure from employers/ University can also present challenges for the development and evolution of dental school curricula. Traditionally, faculty progression was principally centred around research achievements, meaning academic staff with ambitions for progression were often drawn away from teaching activities to devote more time to research. This phenomenon was exacerbated, particularly in UK dental schools, from the Research Assessed Exercise (RAE)/ Research Excellence Framework (REF) processes which required staff to devote significant time on the development of high-quality research portfolios.

There has, however, been welcome developments in UK academia in recent years with the introduction of the Teaching Excellence Framework (TEF) and the development of alternate job profiles and job descriptions in “teaching” and “teaching and scholarship”. Career pathways in these domains offer staff the opportunity to focus on the delivery of high-quality educational programmes, underpinned by high-quality educational research, where appropriate

4. Where will future dental school teachers and leaders come from?

A real challenge for dental schools is the recruitment and retention of quality staff who can provide leadership and delivery of modern educational programmes. While the current and more recently retired generation of clinical academic teachers followed traditional career pathways, many significant and challenging hurdles have been introduced in career development in academic dentistry. Within the authors’ own specialty (Restorative Dentistry), it can now take an estimated 12–13 years in the UK setting from the time of graduation to reach an “entry level” senior appointment as a Senior Lecturer/ Associate Professor/ Consultant when the demands of academic dentistry and clinical consultant training are satisfied (4 years post-graduation experience to enter clinical training, minimum 5 years of clinical training, 3–4 years PhD). When student debt, quality of life issues, job security, competing interests, such as lucrative general or specialist practice are considered, it is suggested that this model is no longer “fit for purpose” as it does little or nothing to attract individuals into clinical academic dentistry and leadership in dental education. Difficult, important decisions are required in this field in coming years. Could clinical instruction in dental schools be largely provided by general dental practitioners suitably trained in both contemporary clinical techniques and approaches and educational methodologies, akin to those in medicine responsible for instruction in general (medical) practice, thereby reducing the need for highly qualified clinical academics? An extension of this approach may be more exposure of undergraduate dental students to ‘real world’ general practice, with opportunity to at least observe the dental team approach to patient care. Such innovation may help to best prepare dental student to motivate many more patients to accept personal responsibility for their oral health and help drive oral healthcare towards holistic, patient-centre, preventatively-orientated, minimum interventional approaches. Again, dental education will need strong, effective leadership to undergo such transformational change.

5. Conclusion

Many, different challenges need to be addressed if dental education

is to remain fit for future purpose. Strong effective leadership is required to address these challenges. To prepare individuals to meet this need, tomorrow’s leaders in dental education must receive much more instruction in leadership than occurs at present.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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