

IN BRIEF

- Looks at the importance of continuing professional development and hands-on courses.
- Investigates the teaching of Electrosurgery and introduces a new interactive teaching model.
- Outlines different strategies for effective delivery of a hands-on course.

Going interactive: six strategies to meet the challenge of teaching Electrosurgery to general dental practitioners

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Mandatory continuing professional development has resulted in a recent expansion in postgraduate dental teaching. One popular type of teaching is the practical 'hands-on' course that combines the explanation of theory with the acquisition of practical skills in small groups. The challenge to dental teachers is to provide the best level of teaching on these courses where the course participants bring varied expectations and different levels of knowledge, skill or interest. This paper presents a new teaching model that has been developed for the postgraduate teaching of Electrosurgery. The key components of this course include an interactive theory lecture using multimedia, followed by hands-on practical teaching. The emphasis throughout is on the use of facilitation and group learning rather than traditional didactic teaching. A series of strategies for the effective delivery of such a hands-on course together with evaluation of findings from 31 courses are considered.

BACKGROUND

The introduction of mandatory continuing professional development (CPD), defined by the General Dental Council as 'study, training, courses, seminars, reading and other activities undertaken by a dentist which could reasonably be expected to advance his or her professional development as a dentist'¹ has led in recent years to a rapid expansion in postgraduate dental teaching.

One of the most popular styles of learning is the 'hands-on' course, whereby small group teaching of practical skills, often incorporating theoretical components, can be used to introduce new clinical techniques and revisit previous knowledge. The purpose of this paper is to describe the delivery of the one-day course from the perspective of the course presenters using six strategies to highlight the main benefits of the interactive approach. This is complemented with evaluation data from 31 of the courses delivered over a period between 1999 and 2004 and drawing on questionnaire results from 297 respondents.

The numbers of dentists attending this type of course is increasing² (Fig. 1) and such courses may contain varying numbers of participants who are there only because of statutory requirements or to seek 'free' information. Their principal interest is for example to obtain specific product or technique recommendations and not necessarily to engage with an educational process.³ This has set a new

challenge to dental teachers: that of meeting the needs of the 'mixed expectation audience'. How can their interest and participation be stimulated and at the same time incorporated into the learning process? With differing levels of knowledge and understanding, such groups demand fresh approaches to creating exciting and rewarding learning opportunities.

The subject area of Electrosurgery was selected as it combines both theory and practice and is not routinely taught to undergraduates in United Kingdom dental schools. Consequently knowledge of the subject area amongst GDPs is varied, with little opportunity to become familiar with its applications. This sets a further teaching challenge: how does the teacher introduce to a group of mixed learners sufficient knowledge to allow the safe use of the technique after just one day's tuition?

This scenario prompted the use of a new teaching model. Developed over a 10-year period, the subject areas were

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divided into lecture and practical components with a lead teacher for each section. The principal components are an interactive theory lecture using multimedia, followed by hands-on practical teaching. The key difference in our approach is the widespread use of facilitation and group learning, as opposed to traditional didactic teaching.

It follows therefore that a course presenter should aim to create an environment in which the participants positively engage with the learning process. This introduces the concept of interactive teaching, which can be described in terms of either a two-way dialogue between presenter and participants, or an increased discussion between the participants themselves.⁴ Closely allied to interactive teaching is 'deep' learning, an experience that goes beyond simple memorisation of facts, encouraging a more lasting and profound understanding. Four basic tenets of 'deep' learning have been described as the FAIR principles:⁵ *Feedback*, encouraging the learner to assess their own level of knowledge or proficiency with an opportunity for self-correction; *Activity*, which is learning-by-doing and could involve case studies, practical exercises and group discussions; *Individualism*, which refers to personal need, centering on preferred learning styles, method and pace of learning; *Relevance*, indicating whether the learning can be directly applied to a work setting or environment. These principles are incorporated into our methodology.

The lecturing has been modified to embrace an interactive process whereby input is constantly invited and sought both from the group and from the individual. In order for this to take place, the participants (*including the teacher*) must feel secure, comfortable, and not unduly exposed, to keep them on track.^{6,7} Learning that takes place in this type of active environment allows for better connection with the course material and the person teaching it.⁸

THE STRATEGIES

Strategy 1: create a learning environment perceived as safe and non-threatening

Many people are initially nervous or shy about taking part in a process that requires some active involvement between teachers and those being taught. From our experience it requires

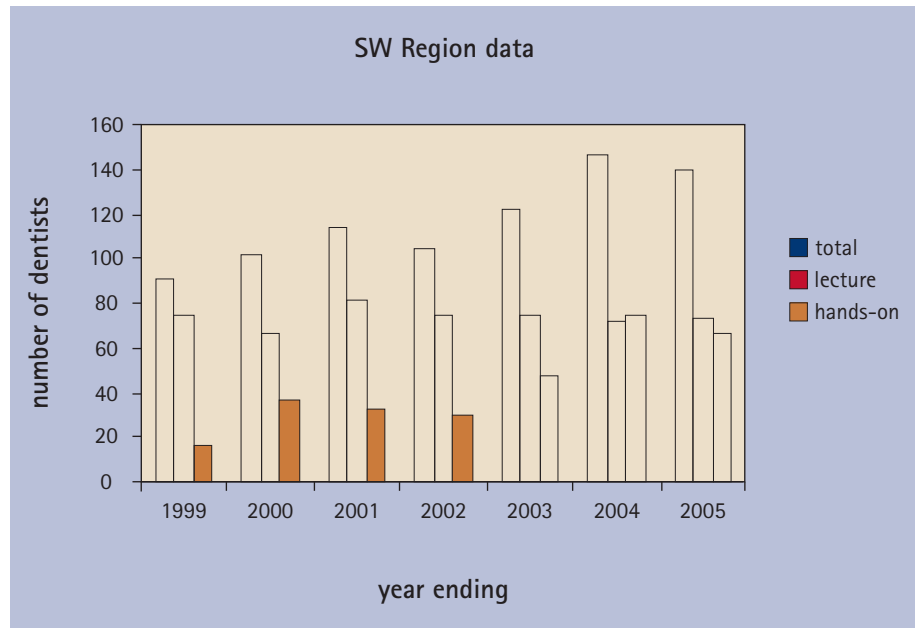


Fig. 1 Data from one region (SW England) showing the increase in the number of hands-on courses while lecture course numbers remain static

Fig. 2a Course Feedback and Evaluation Form

ELECTROSURGERY & SOFT TISSUE MANAGEMENT

Dear Colleague

We hope you found our course interesting and relevant to your practice. We do, however, need *your* help to further improve the content and teaching methods. Would you please complete the following Questionnaire, thank you.

1. Did you enjoy the course?
Yes No Don't know

2. Was it what you expected?
Yes No Don't know

3. Have we given you enough *factual* information during the course?
Yes No Don't know

4. If you have not done electrosurgery before, do you now feel sufficiently confident to start using the technique?
Yes No Don't know

5. Can you recall *five* key features or points about Electrosurgery that you would find useful in your practice?
a) _____ b) _____ c) _____
d) _____ e) _____

6. The teaching style of the course is INTERACTIVE – do you prefer this approach?
Yes No Don't know

7. Could you describe the BEST parts of the course?

8. And the WORST parts of the course?

9. Is there anything *you* feel we should have included (or indeed, left out)

10. How would you now rate the course having had a period of time to reflect on the matter? Please indicate your response by making a mark at the appropriate place on the line below:

VERY POOR/ _____ /EXCELLENT

careful facilitation to make the participants feel welcome and set them at their ease, whilst outlining the aims and objectives of the course and introducing the theme of interactive teaching.

It has been found helpful to use humour as part of this process. Humour is understood to reduce anxiety and stress, build confidence, improve productivity, heighten interest, reduce boredom and encourage divergent thinking,⁹ and our experience would tend to support this. The degree to which it is employed, and the style adopted, is left to the discretion and skills of the individual course presenter.

To enhance non-verbal communication the course presenters are, where possible, seated at the same level as the course participants. It is acknowledged that this can be difficult to arrange within the setting of some skills laboratories where the teacher's place has already been defined at a higher level or behind a desk or table. The seating plan ideally follows a horseshoe arrangement,¹⁰ which allows maximum eye contact between teachers and learners. An informal dress code is frequently found at dental meetings and this, together with an easy conversational style and the use of first names, can be helpful in furthering an atmosphere of openness and accessibility.

Strategy 2: establish the theme of interactivity early by using an 'ice-breaker'
This component of the course lasts for approximately 10 minutes and serves to establish the theme of the day's activities. Adopting the role of facilitator, the teacher invites participants to give a short personal background to the rest of the group including what they hope to achieve from the course. This serves to establish the beginnings of group cohesiveness and often gives valuable information as to present levels of understanding, experience and expectation. Importantly it can also allow local flexibility which may require the pace and content to be varied to accommodate the needs of the actual audience present on the day.

Strategy 3: include an early structured-interactive lecture

The format of the lecture follows where possible the seating arrangements described earlier with the teacher adopting the role of a group leader rather than

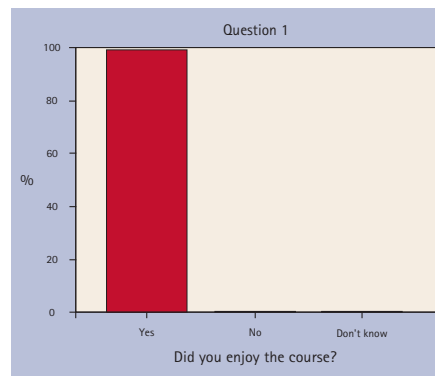


Fig. 2b Question 1: Did you enjoy the course?

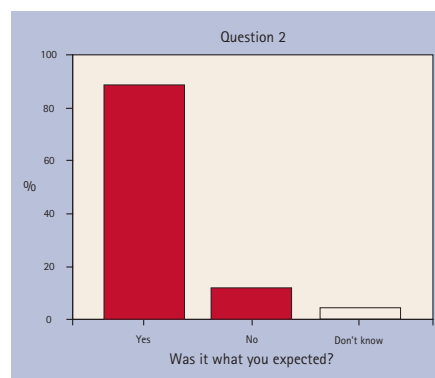


Fig. 2c Question 2: Was it what you expected?

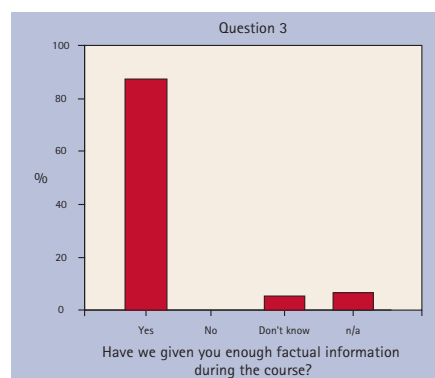


Fig. 2d Question 3: Have we given you enough factual information during the course?

a didactic lecturer. Open discussion is encouraged with participants contributing input either by answering questions posed by the teacher or responding to issues raised by the group itself. Essential theory and clinical application is covered using a combination of PowerPoint slides, overhead projections and video, together with a hand out for post-course revision. The video clips used specifically illustrate the techniques to be used later in the course. In the future it is planned that this component could take place prior to the practical aspects of the course by the use of e-learning, with the lecture content either presented online or using DVD.

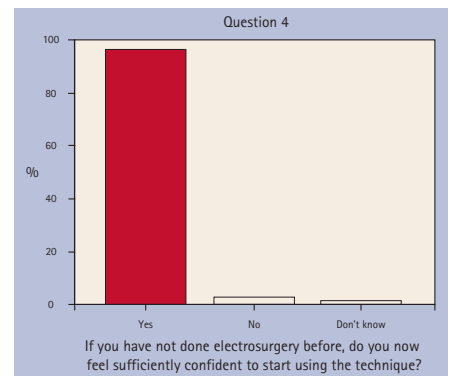


Fig. 2e Question 4: If you have not done electrosurgery before, do you now feel sufficiently confident to start using the technique?

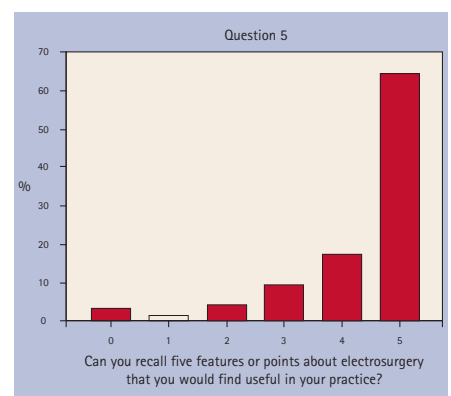


Fig. 2f Question 5: Can you recall five features of points about electrosurgery that you would find useful in your practice?

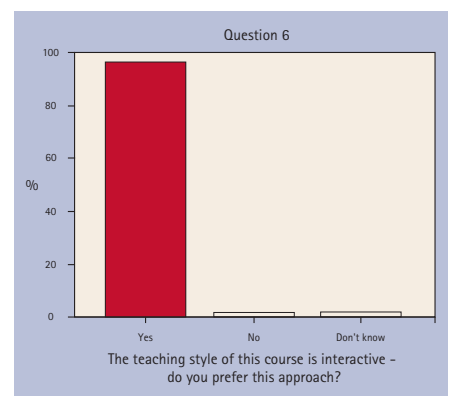


Fig. 2g Question 6: The teaching style of the course is interactive - do you prefer this approach?

Strategy 4: allow a short post-lecture break before introducing a 'brain streaming' session
'Brain streaming' is the facilitated group activity described by Peterson,¹¹ where the essential points made in a lecture are identified and reinforced, serving as an immediate revision of the preceding activity. Incorporating both facts, thought processes and ideas, it enhances logical thinking. This is not the same as the 'brainstorming' of a topic, where the emphasis is more about the

Fig. 2h Question 7: The best part of the course—feedback as reported from common recurring themes

Hands-on sessions	Approach of presenters	Interactive nature of course	Demonstrations by presenters
N = 95	N = 20	N = 17	N = 11
Total responses n = 143			

Fig. 2i Question 8: The worst part of the course— feedback reported from common recurring themes

Smells from using pig jaws	Giving group presentations	Time pressures on course	Poor venue
N = 31	N = 8	N = 7	N = 3
Total responses n = 143			

Fig. 2j Question 9: Is there anything you feel we should have included (or indeed, left out)? Feedback reported from common recurring themes

Included	Left out
Other forms of retraction & soft tissue management (n = 3) A video of alive clinical case (n = 3) A live clinical case (n = 2)	Leave out video of demonstrations (n = 1)
Total responses n = 9	

generation and discussion of random thoughts and ideas, with the intent of exploring all possibilities. We have found that ‘brain streaming’ can encourage a wider sharing and ownership of learning.

Strategy 5: the volunteer teacher

The hands-on components of the Electrosurgery technique are introduced using prepared pig jaws and tongues. A volunteer, with close support from the course leaders, is invited to adopt the role of technique demonstrator. They are asked to attempt the first and simplest practical procedure shown in the lecture. Their individual surgical skills are captured by one of the teaching team using close-up live video. As an integral part of group learning,¹² they are then encouraged to revisit the essential features of the procedure with the rest of the group. The video clips obtained provide an excellent opportunity to give or receive feedback from the teacher or other members of the group.

Strategy 6: the group task

The participants then gather around a workstation in self-selected subgroups of between two and four to explore the demonstrated task. When there is an

overall consensus that these basic skills have been achieved, with guidance from the teacher, another volunteer is invited to carry out more advanced procedures, again using live video to assist with visualisation of the procedure.

During activities at the workstations, a teacher is available to offer individual tuition and feedback. It is also possible to make minor, on-the-spot adaptations to the programme should, for example, the ‘pace’ of the course be considered inappropriate for that group of learners.

The final and most challenging aspects of the Electrosurgery technique are then left with the groups to problem-solve for themselves, having now acquired sufficient basic skills from the introductory exercises. Throughout this process the teacher can give feedback on progress.

When the set practical exercises have been completed, the course concludes with a plenary discussion focussed on a series of clinical slides. During this period the participants complete an anonymous evaluation questionnaire, which includes a modified Visual Analogue (rating) Scale (VAS).¹³

FINDINGS

The design of the questionnaire included open and closed questions allowing for

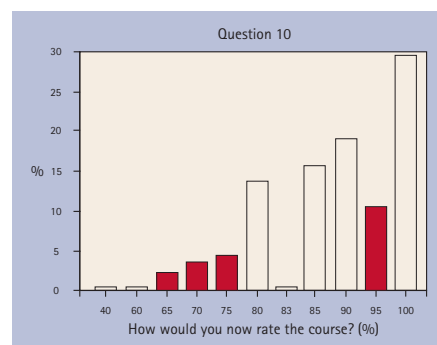


Fig. 2k Question 10: How would you rate the course?

both qualitative and quantitative feedback as shown in Figure 2a-k.

The participants were asked to give an overall rating for the course using a modified visual analogue scale. Using descriptors of ‘poor’ to ‘excellent’, a mark was placed on a 10 cm long horizontal line. During analysis, the mark on the line was measured to give a percentage score.

Thirty-one courses were surveyed, giving 292 responses from 300 course participants. The majority of participants (87%) rated the course above 80%, with almost a third of the total number rating the course at 100%.

DISCUSSION

The success of hands-on teaching is dependent on many factors and can be considered from a variety of angles. The approach taken was to design a new course for the teaching of specific clinical skills in an acceptable and enjoyable format. The responses to question 1 were 99% positive as to this aspect of the course format. Methods that are very familiar in dental teaching, namely the didactic lecture and the phantom-head classroom exercise, have been re-fashioned and modified to make learning attractive and accessible. Again responses to course expectations and content in questions 2 and 3 were equally positive (85% and 88% respectively). Developments have centred on a facilitative approach to teaching, linked to strong group interaction supported by some use of multi-media technology. Our collective teaching experience tends to support the view that dentists favour learning that can easily be applied to real-life situations. The responses received to question 4 concerning confidence to proceed with Electrosurgery technique following the course (98% positive) and question 5 (65% of

participants being able to recall five relevant facts concerning Electrosurgery) would tend to support this assertion. There is already much research that supports the premise that students who learn actively learn more than those who adopt a passive approach.^{1,2} Our findings also note that an interactive teaching style was popular with this group of learners as seen from the feedback in question 6 (97% positive).

The use of volunteers as 'peer teachers' to demonstrate basic Electrosurgery technique was observed as a successful teaching strategy. It serves to heighten levels of attention and interest in the procedure and fosters strong support for the demonstrator who is seen to be 'in the hot seat'. The use of real-time video allows for excellent visualisation of the surgical field and provides a very effective tool for conveying information.

The course presenters' reflections are that the learning environment created on these courses has been shown to work extremely well for general dental practitioners.

It is also interesting to note that the technique exercises are usually well executed whatever the combination or structure of the group. This contrasts with findings from other health care

professionals who have reported weak group processes and interactions when using similar methodologies.^{16,17} The literature contains sparse reference to the needs and preferred learning styles of general dental practitioners, although Cannell's recent case study,¹⁸ designed to reinforce knowledge around Hepatitis B immunisation in general dental practice, recognised that learning styles were an important tool in providing effective course delivery.

The responses to question 7 also tend to support the anecdotal wisdom that dentists like hands-on teaching formats.

The principal conclusions from this work are that general dental practitioners respond well to new learning that is presented in a lively, interactive forum. Being able to contribute a significant degree of input to the learning process was seen as strongly positive. Enjoyment and success engender a winning cycle in the learning environment.¹⁹ The use of an immediate post-course questionnaire was seen as a valuable diagnostic and quality control instrument.

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