Improving the quality of clinical teaching in a restorative clinic via student feedback.

C.C. Youngson[1], K. Fox[1], E.L.Boyle[1], K Blundell[1], R.G.Baker[2]

[1] Restorative Dentistry
Liverpool University School of Dental Sciences
Pembroke Place
Liverpool L3 5PS
United Kingdom

[2]Leeds Dental Institute
Clarendon Way
Leeds LS2 9LU
United Kingdom.

Correspondence to:
Prof CC Youngson
Head of Division of Dentistry/ Professor of Restorative Dentistry
Liverpool University School of Dental Sciences
Pembroke Place
Liverpool L3 5PS
United Kingdom

Tel 0151 706 5230
Fax 0151 706 5265

Key words/phrases:
Feedback, Clinical teaching, Quality

Abstract:

Introduction: A large proportion of the undergraduate curriculum is spent within Restorative Dentistry at the University of Liverpool. As well as supportive “phantom head” courses the undergraduates receive significant amounts of teaching within the clinics themselves. In 2004, to help inform the clinical tutors as to their areas of strengths and weaknesses, undergraduates were invited to complete an anonymous questionnaire on the quality of teaching they received from their clinical supervisors. This process has been repeated subsequently in 2005 and 2006.

Method: A 19 parameter questionnaire, employing a 5-point Likert scale and space for open comments, was circulated to every clinical undergraduate student. Questionnaires were returned anonymously and all data collected by one researcher. Descriptive statistical analysis was performed and the staff provided with individual feedback within the context of the overall departmental profile. The pooled data from each of the years was then compared to determine if any changes had occurred. Statistical analysis used Kruskal Wallis tests to determine whether these were statistically significant.

Results: Although the range varied, median scores of 4 (agree) were gained for each question each year. Following statistical analysis 18 of the parameters showed a statistically significant improvement ($p < 0.05$) between 2004 and 2006 with only one remaining constant throughout.

Conclusion: It would appear that the use of a questionnaire based feedback system can result in a tangible and demonstrable improvement in the staff’s delivery of their clinical teaching.

Introduction:

The use of a variety of appraisal processes is becoming widespread in the assessment of medical and dental training grade staff in the UK (1). The use of 360° appraisal is also widespread throughout many forms of organisation, although the value of the feedback gained is determined by the structure of the process and recognition of its inherent difficulties (2). There is also a risk that feedback can be used as an aspect of performance management of an individual rather than simply trying to improve the productivity of an organisation (2).

The concept of using a student feedback system to improve teaching is not new (3) and Kidd et al's work in the mid 1990's (4) was one of the first in dentistry to assess preclinical teaching by means of a questionnaire. "Phantom head" courses within restorative dentistry lend themselves to longitudinal assessment and have been shown to be able to be improved by a feedback process (5). However, there have been relatively few publications assessing the quality of clinical teaching. A recent paper (6) has outlined the use of a questionnaire to evaluate clinical teaching but no further publications from this group are yet available that could have demonstrated the utility of this feedback in improving the students' experience.

In 2004, following departmental restructuring, it was considered worthwhile to determine the perceived quality of teaching supervision in the Restorative Dentistry clinic at Liverpool University Dental School. It was decided that an anonymised questionnaire was an appropriate method of gaining this feedback. The aim of the current study was to determine whether this feedback process affected the perceived quality of teaching by comparing results gained in subsequent years with those of 2004.

Methods:

A questionnaire (Fig 1) was devised. This assesses some of the qualities determined by Wilson (3) and has many similarities to the questions asked by Kidd et al, Chadwick and McGrath et al (4-6) despite being devised independently and without intentional reference to them. At the end of each questionnaire was an invitation to provide “open comments”.

Prior to the process starting, all students were addressed via a series of meetings to inform them how their anonymity would be preserved and what the purpose of the questionnaire was. Any open comments would be retyped and edited to ensure that a student could not be identifiable to any individual member of staff.

Similar meetings were held with the staff concerned to gain their consent. It was stressed that this was a formative process, the results of which would remain confidential to the primary reviewer and the staff member themselves, although the overall departmental profile of teaching quality could be made available to appropriate bodies.

The questionnaire was circulated to all clinical dental students in 2004, 2005 and 2006 (the name of the clinic changing from Conservation to Restorative during 2004). Each student was invited to complete one questionnaire for each member of staff who had supervised them that clinical term. Although there is slight variation due to various curricular demands, the undergraduates who took part had an average of 3 Restorative clinical sessions per week . In 2004 the questionnaires were circulated after lectures to the year cohorts. In 2005 and 2006 questionnaires were circulated via their University e-mail address, the questionnaire was then printed out by the student and placed in a sealed posting box situated on the clinic or returned folded to

one researcher's (CCY) office. All students were reminded by e-mail before the closing date to reduce non-compliance. Any returns received after the closing date were included as two weeks passed before the data entry was completed.

The questionnaire had several domains: those relating to the staff member's personality [questions 1, 2, 6] professionalism [questions 3, 8, 14], ability to communicate [questions 9, 10, 11, 12, 18], their teaching skills [questions 5, 7, 13], management [questions 4, 15] and their ability to motivate [questions 16,17, 19].

For ease of analysis the descriptors were changed to numerical values (strongly agree = 5, strongly disagree = 1). This data was entered into a spreadsheet and descriptive statistical analysis undertaken using Minitab 14® (Minitab Inc. State College PA 16801-3008, USA). Comparison between data obtained was performed using Kruskal Wallis tests via the same software package.

After each year's analysis of the data, in order to maintain confidentiality, all the staff were assigned a number and then informed of their individual scores compared to the others within the department. They were also provided with the (rewritten) open comments. Staff members were invited to discuss their results with the individual who had performed the data analysis and any areas requiring professional development training identified.

Over the three years, one question was removed (focussing on an organisational change instituted in 2004) and one introduced ("Gives priority to me over private conversations with colleagues - Q14") in response to students' requests.

Three basic staff cohorts were identifiable over the three years. Group a), the "core" were assessed by the students on three occasions. Group b) the core plus six staff

whom were present on two consecutive years (either 2004 and 2005, or 2005 and 2006. Group c) comprised all staff (including transient staff i.e. those present on one assessment only).

Numbers of responses by undergraduates in each year are shown in Table 1. In the first year there was a large response. As most students have clinical sessions with 2 tutors in a term this indicates about a 100% response rate in the first year dropping to about 50% in subsequent years.

The core of staff formed the majority (14). A total of ten staff were only assessed in one cycle (three in 2004, three in 2005 and four in 2006).

The (internal consistency) reliability of the questionnaire was assessed via Cronbach's alpha with a score of 0.97 achieved overall and the lowest value achieved being 0.96.

Results:

An analysis of the male/female response rate shows that this is representative of the undergraduate body (about 40% male: 60% female) indicating that the student body all took part in the feedback process. There was no difference in positive or negative feedback by gender. For each question, at each year, for each staff cohort a median score of 4 (agree) was obtained. However, the range of responses altered and it is this that lent itself to statistical analysis. It was clear that there was an upward trend in all areas. Using Kruskal Wallis testing with significance at 95% level, Group a) were seen to improve at a statistically significant level between 2004 and 2006 on the parameter of stressing important points. When the other six staff were included; Group b) showed statistically significant improvements demonstrated in Table 2.

Tables 2 and 3 show the results of the Kruskal Wallis tests per question per year for the staff cohorts (ns = no statistically significant difference [$p > 0.05$], all other p values shown are the results adjusted for ties).

Over the three years, when comparing the data, there were no questions that showed deterioration in the results in any staff grouping. When the total staff grouping was concerned, only one question "Builds up the patient's confidence in me" remained the same throughout the three years. All other parameters improved at a statistically significant level ($p < 0.05$) between 2004 and 2006.

Discussion:

Anecdotal evidence from the undergraduate students is that the "atmosphere has improved" within the restorative clinic since 2004 and, the authors believe, a significant contributor to this has been the feedback mechanism reported here.

The current study does however, have a number of limitations associated with it. A major issue is the lower response rates in 2005 and 2006 compared to those of 2004. The most likely explanation is the presence of the primary investigator, in 2004, in the lecture theatres when the questionnaire was being completed. In subsequent years the questionnaires were distributed by e-mail with the onus being placed on the student to complete and return these. With 50% response rates for 2005 and 2006 there is a risk that the data has been skewed and so the apparent improvements do not really exist (or significant differences have been missed). However, the still large number of responses would tend to reduce this likelihood and the fact that eight parameters showed improvement between 2005 and 2006 (when similar response rates were achieved) suggests that skewing is unlikely. Another explanation for the lower response rate is "feedback fatigue". However, due to the

anonymous nature of the process it was not possible to get a higher response rate as non-responders were not identifiable.

It can be seen from Table 1 that there was an increase in the number of students between 2005 and 2006 without a comparable increase in staff. It would, however, be simplistic to assume that this resulted in increased staff-student ratios. As the students have timetabled allocations to their clinical sessions, and similar numbers of students allocated to each member of staff, it has proven possible to maintain the staff-student ratio by slightly increasing the number of sessions available throughout the week, all staff therefore had the same workload throughout the study period. There were no curricular changes or changes in the demographics of the undergraduates or staff that could account for perceptual changes between 2004 and 2006.

With respect to the post feedback interviews with the staff, on each occasion the majority of staff who had performed well declined the invitation. However, on each of the three years assessed, the three staff who had performed least well attended for interview (a total of five individuals). There was a mix of reaction to the feedback process, Three staff (from the core group) viewed it as a positive method of improving their performance in a guided fashion. Two staff (from the “transient” group) felt that it was a negative process and that it had little value in their professional development. The staff who felt it was valuable showed improvements over the period assessed. There was no clear correlation between the amount of experience of the teaching staff with the positivity of the feedback gained.

As can be seen in Table 3 only a few questions are associated with statistically significantly differences between 2004 and 2005, but many are present between 2005 and 2006. This may lead one to believe that there was a sudden improvement

between 2005 and 2006. However, from analysis of the whole data it is apparent that the improvements occurred throughout the whole period, but tended to only gain statistical significance latterly.

In formulating the questionnaire a number of different types of question were asked and it could be argued that they are not all equally important e.g. “Never criticises me in front of a patient” -shown to be a high stressor (7) compared to “Is interested is students”. However, the questions were considered to assess desirable aspects of an “ideal” teacher (8), and the original purpose of the questionnaire was to provide feedback to staff of their strengths and weaknesses.

Although the majority of staff were assessed on three occasions, some were only available twice and others only once. It appears that statistically significant differences arose due to changes in personnel, but there was also, limited, improved behaviour within the staff. The “transient” staff consisted of two full-time clinical academic staff who retired after the 2004 assessment, and five who took up clinical teaching duties between 2005 and 2006. The other three of this cohort were general dental practitioners who taught part-time.

The data may have been skewed by the induction process for staff appointed after the 2004 assessment. These staff were shown the questionnaire during the introduction to their teaching post and so expectations of behaviour standards of teaching were rendered explicit. However, it is worth noting that the median results remained constant (4 = agree) for all parameters suggesting that all the staff were performing well originally. The improvements arose from a tendency for the range to move towards higher ratings. Thus it appears that the quality of the experience has improved from a very acceptable baseline.

It is difficult to understand how ratings of staff patience can have improved as these may be considered to be embedded within their personality trait. On the other hand, knowing that this is an aspect that is open to assessment, the staff may have adopted alternative behaviours within that environment to achieve a higher score at the next assessment (cognitive awareness).

The current process will continue in an attempt to maintain the quality of teaching but alternative methods of data collection are being considered to improve the return rate in future.

Conclusion:

Despite limitations in the methodology, it would appear that the use of a questionnaire based feedback system can result in improved clinical teaching by staff.

Tables.

Table 1. Completed questionnaires received each year

Year	Number of clinical teaching staff	Number of clinical undergraduates	Number of responses
2004	22	148	287
2005	23	149	164
2006	23	188	187

Table 2 Results of Kruskal Wallis tests: Group b) core plus six

	2005	2006
Is patient		
2004	Ns	p = 0.031
2005		p = 0.026
Gives clear explanations		
2004	Ns	Ns
2005		p = 0.043
Stresses important points		
2004	Ns	p = 0.001
2005		p = 0.001
Helps me to think in broader context		
2004	Ns	p = 0.029
2005		Ns

Table 3. Results of Kruskal Wallis tests: Group c) All staff		
	2005	2006
Is patient		
2004	Ns	p = 0.001
2005		p = 0.000
Has a pleasant manner		
2004	Ns	Ns
2005		p = 0.025
Never criticises me in front of patients		
2004	Ns	p = 0.028
2005		Ns
Helped me with requirements		
2004	Ns	p = 0.005
2005		Ns
Is interested in students		
2004	Ns	P = 0.001
2005		p = 0.002
Is approachable		
2004	Ns	p = 0.026
2005		p = 0.021
Consistent with textbooks/ staff		
2004	Ns	p = 0.007
2005		Ns
Is punctual and available		
2004	Ns	p = 0.002
2005		p = 0.000
Gives clear explanations		
2004	Ns	p = 0.001
2005		p = 0.001
Stresses important points		
2004	Ns	p = 0.000
2005		p = 0.000
Helps me to think in broader context		
2004	p = 0.007	p = 0.000
2005		Ns
Provides clear instructions		
2004	ns	p = 0.002
2005		Ns
Gives appropriate practical support		
2004	ns	p = 0.015
2005		Ns
Gives me priority over conversations		
2005		p = 0.001
Manages queues of well		
2004	p = 0.048	p = 0.002
2005		Ns
Gives me confidence		
2004	ns	p = 0.043
2005		Ns
Builds the patient's confidence in me		
2004	ns	Ns
2005		Ns
Helps me to know how I can improve		
2004	Ns	p = 0.014
2005		Ns
I generally look forward to working with this member of staff		
2004	Ns	p = 0.013
2005		Ns

Figure 1. Questionnaire

Anonymised Student Feedback on Clinical Teaching – **Cons/Restorative area**

Year 3 ,4, 5 Male/Female (please circle)

Below are various scales relating to the quality of clinical teaching. Please underline or circle whichever response best reflects your current experience of clinical teaching with: ..... **(Insert name of clinical tutor)**
(please fill in one questionnaire for each different tutor)

1. He/she is patient	*Strongly agree*	*Agree*	*Not sure*	*Disagree*	*Strongly Disagree*
2. Has a pleasant manner	*Strongly agree*	*Agree*	*Not sure*	*Disagree*	*Strongly Disagree*
3. Never criticises me in front of patients	*Strongly agree*	*Agree*	*Not sure*	*Disagree*	*Strongly Disagree*
4. Has helped me to make progress with my requirements	*Strongly agree*	*Agree*	*Not sure*	*Disagree*	*Strongly Disagree*
5. Is interested in students	*Strongly agree*	*Agree*	*Not sure*	*Disagree*	*Strongly Disagree*
6. Is approachable	*Strongly agree*	*Agree*	*Not sure*	*Disagree*	*Strongly Disagree*
7. Gives guidance that is generally consistent with textbooks/other staff	*Strongly agree*	*Agree*	*Not sure*	*Disagree*	*Strongly Disagree*
8. Is punctual and is available throughout the clinical session	*Strongly agree*	*Agree*	*Not sure*	*Disagree*	*Strongly Disagree*
9. Gives clear and comprehensible explanations	*Strongly agree*	*Agree*	*Not sure*	*Disagree*	*Strongly Disagree*
10. Stresses important points	*Strongly agree*	*Agree*	*Not sure*	*Disagree*	*Strongly Disagree*
11. Helps me to think of matters in the broader context	*Strongly agree*	*Agree*	*Not sure*	*Disagree*	*Strongly Disagree*
12. Gives clear instructions	*Strongly agree*	*Agree*	*Not sure*	*Disagree*	*Strongly Disagree*
13. Will provide an appropriate level of practical support at the chairside	*Strongly agree*	*Agree*	*Not sure*	*Disagree*	*Strongly Disagree*
14. Gives me priority over private conversations with colleagues	*Strongly agree*	*Agree*	*Not sure*	*Disagree*	*Strongly Disagree*
15. Manages queues of waiting students well	*Strongly agree*	*Agree*	*Not sure*	*Disagree*	*Strongly Disagree*
16. Gives me confidence	*Strongly agree*	*Agree*	*Not sure*	*Disagree*	*Strongly Disagree*
17. Builds up the patient's confidence in me	*Strongly agree*	*Agree*	*Not sure*	*Disagree*	*Strongly Disagree*
18. Helps me to know how I can improve	*Strongly agree*	*Agree*	*Not sure*	*Disagree*	*Strongly Disagree*
19. I generally look forward to working with this member of staff	*Strongly agree*	*Agree*	*Not sure*	*Disagree*	*Strongly Disagree*

Any Other Comments
(Please continue overleaf if required)

References

1. Modernising Medical Careers website. Assessment.
http://www.mmc.nhs.uk/pages/assessment
(last accessed 23 Apr 2007)

2. Peiperl MA. Getting 360° feedback right. Harv Bus Rev 2001:79:142-147.

3. Wilson RC. Improving faculty teaching: Effective use of student evaluations and constraints. J Higher Educ 1986: 57: 196-211.

3. Kidd EA, Millard L, Smeeton NC, Millard AJ. Improving the quality of teaching: staff responses to students' views. Br Dent J 1994: 177: 208-212

4. Chadwick RG. Quality assurance by service quality — an industrial approach to monitoring course delivery. Br Dent J 2002: 192: 285-288

5. C. McGrath, R. Wai Kit Yeung, M. B. Comfort, A. S. McMillan. Development and evaluation of a questionnaire to evaluate clinical dental teachers (ECDT). Br Dent J 2005: 198: 45-48.

6. Z. Morse, U Dravo. Stress levels of dental students at the Fiji School of Medicine. Eur J Dent Educ 2007: 11: 99–103

7. Fugill M. Teaching and learning in dental student clinical Practice: Eur J Dent Educ 2005: 9: 131–136