Feedback from dental students using two alternate coaching methods: a course-based evaluation

Rana Alkattan, Lulwah Alreshaid

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Rana Alkattan[1, 2, 3] BDS, MSD, PhD; Lulwah Alreshaid[1, 2, 3] BDS, PhD

[1]King Saud bin Abdulaziz University for Health Sciences Riyadh SA
[2]King Abdullah international medical research centre Riyadh SA
[3]National Guard Health Affairs Riyadh SA

Corresponding Author:
Rana Alkattan BDS, MSD, PhD
King Saud bin Abdulaziz University for Health Sciences
Prince Mutib Ibn Abdullah Ibn Abdulaziz Rd
Riyadh
SA

Abstract

Background: Student feedback is crucial for evaluating the effectiveness of institutions. However, implementing feedback can be challenging due to practical difficulties. While student feedback on courses can improve teaching, there is debate about its effectiveness if not well-written to provide helpful information to the receiver.

Objective: This study aimed to evaluate the impact of coaching on proper feedback given by dental students in Saudi Arabia.

Methods: First-year dental students were asked to complete three surveys throughout the academic year. The surveys assessed their feedback on the course, including lectures, practical sessions, exams, and overall experience. The surveys were distributed without coaching, after handout coaching and after workshop coaching on how to provide feedback, designated as survey #1, survey #2 and survey #3, respectively. The responses were then rated as neutral, positive, negative, or constructive by two raters. The feedback was analyzed to compare the effectiveness of the different coaching approaches.

Results: While no significant changes were found between the first two surveys, a significant increase in constructive feedback was observed in survey #3 after workshop coaching (P<.001). The results also showed a higher proportion of desired changes in feedback, determined as a change from any rating to constructive rating, after survey #3 (P<.001). Overall, 20.2% reported desired changes at survey #2 and 41.5% at survey #3 compared to survey #1.

Conclusions: This study suggests that workshops on feedback coaching can effectively improve the quality of feedback provided by dental students. Incorporating feedback coaching into dental school curricula could help students communicate their concerns more effectively, ultimately enhancing the learning experience.

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Original Manuscript

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Lulwah Alreshaid[1,2,3] and Rana Alkattan[1,2,3]

[1] Department of Restorative and Prosthetic Dental Sciences, College of Dentistry, King Saud bin Abdulaziz University for Health Sciences (KSAU-HS), Riyadh 11426, Saudi Arabia
[2] King Abdullah International Medical Research Center, Ministry of National Guard Health Affairs, Riyadh, 11481, Saudi Arabia
[3] Dental Services King Abdulaziz Medical City, Ministry of the National Guard- Health Affairs, Riyadh 11426, Saudi Arabia

***Corresponding author**

Rana Alkattan, Department of Restorative and Prosthetic Dental Sciences, College of Dentistry, King Saud bin Abdulaziz University for Health Sciences (KSAU-HS), Riyadh 11426, Saudi Arabia, e-mail: dr_rkk@hotmail.com

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Conflict of interest

The authors of this manuscript certify that they have no proprietary, financial, or other personal interest of any nature or kind in any product, service, and/or company presented in this article.

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Abstract

Background

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Methods

First-year dental students were asked to complete three surveys throughout the academic year. The surveys assessed their feedback on the course, including lectures, practical sessions, exams, and overall experience. The surveys were distributed without coaching, after handout coaching and after workshop coaching on how to provide feedback, designated as survey #1, survey #2 and survey #3, respectively. The responses were then rated as neutral, positive, negative, or constructive by two raters. The feedback was analyzed to compare the effectiveness of the different coaching approaches.

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Conclusions

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KEYWORDS

Feedback, Coaching, Dental Education, Student Evaluation, Teaching Methods.

Introduction

Feedback is a critical method of measuring the effectiveness of performance and outcome of any institution. More importantly, if these institutions play an important role in education, health, or essential services, it is crucial to utilize the feedback to ensure the successful performance of these institutions. Feedback is often challenging to execute due to interaction issues or practical applicability.[1, 2] Challenges arise from a complex interaction between the providers and recipients' performance.[2] An example of these challenges could be the fear of recognizing unsatisfactory performance, discouragements, and liability. However, feedback's primary purpose is to improve the outcome. Delivering productive feedback to assess teaching procedures and students' experience is critical for effective learning and developing a solid connection between feedback providers and recipients.[3-5] In addition, it serves to evaluate teaching strategies.

Giving feedback to recipients, especially students, can be challenging; however, various techniques can be implemented; one of the popular techniques is the "compliment sandwich," in which the recipient can receive one criticism between two positive comments.[6] In contrast, another effective technique is to eliminate the negative connotation of feedback, in which the provider can discuss the problem by mentioning the mistakes and providing some solutions.[7] Aside from the technique used to provide the feedback, it is crucial to note that effective feedback comprises structure, content, and time.[8] It also requires an emotionally safe environment for the recipient to understand the goal of the process. Additionally, to give constructive feedback, it is important to consider that the goal is not to deliver the feedback to the recipients of their work being criticized or evaluated alone but to enhance the feedback process to be more effective.[9, 10]

Many educational institutions also imply student and professor feedback concerning courses in which they are both involved.[11] The feedback from the students, on the other hand, usually involves a set of surveys to rate a course and the instructor giving that course. This process could assist the instructors in better-recognizing areas of strengths and weaknesses, ultimately improving the educational experience.[12-14] Debate emerges that questions the effectiveness of such feedback.[12, 15-17] A recent study found that implementing feedback could be beneficial if incorporated into the curriculum while also providing instructors with how to receive such feedback and how to adapt to these comments.[14, 18, 19] Moreover, another author highlighted the importance of student evaluation and excelling in education, which could provide the instructor with minor adjustments to reform the course.[18-20] In contrast, some instructors note that this feedback will not encourage them to modify their courses.[20] Moreover, some instructors might find it difficult to solely base altering decisions on feedback provided by students, arguing that some aspects will affect the student's ability to provide trustworthy information based on factors such as the ability to construct critical feedback or complex circumstances, including age, gender or educational background.[15, 21]

Although previous studies assessed the effect of feedback given by students on teaching quality and the improvement of feedback over a certain period,[11, 15] the relations between coaching to

give and receive feedback and the feedback received from students after coaching have not been investigated among dental students in Saudi Arabia. Teaching students how to provide reflective, constructive feedback to elicit better outcomes for course, curriculum, and general educational development would be significant. Thus, the primary objective of this study was to evaluate the feedback given by students in the College of Dentistry (COD), King Saud bin Abdul-Aziz University (KSAU-HS), after using two different coaching approaches on how to provide feedback. The secondary objective was to improve the effectiveness of the feedback given by dental students after exposing them to two different coaching approaches on how to provide feedback. The null hypothesis of the current study is that there is no difference in the nature of the feedback given by the students after coaching them on how to provide feedback.

Methods

An institutional review board ethical approval was obtained from King Abdullah International Medical Research Center (KAIMRC) for this cross-sectional study **IRB/3004/23**. This study was conducted during the academic year 2023- 2024 among first-year dental students who took the Dental Anatomy and Operative Dentistry course (RSTO 311) at the College of Dentistry (COD), King Saud bin Abdulaziz University (KSAU-HS). The RSTO 311 is a yearly course divided over three trimesters. The course has theoretical and practical components: 30 lectures and 40 practical sessions. The students were assessed based on weekly continuous assessment, three quizzes, three written exams, and three practical exams.

Study design

Fifty students were invited to participate in the study. Students were asked to complete three surveys in open-ended question format at the end of each trimester. These surveys asked the same questions but were specific to each trimester. Invited students were asked to provide feedback on the RSTO 311 course. Each survey consisted of five questions. The first question was to indicate the 2-digit number assigned to each student by a research assistant who never interacted with the students to ensure anonymity. The second question was about the lectures given during the trimester. The third question was about the practical sessions taken during the trimester. The fourth question was about the quizzes, written and practical exams taken during the trimester. The fifth and last question was about the overall course (Appendix A).

At the beginning of the course, an invitation was sent to all students taking the RSTO 311 course. The students were offered a bonus (two grades) if they participated in the study. If they wished not to participate, they could write an essay about a topic related to their course and get a bonus grade. The survey was designed using Google Forms and was sent via email to all participating students; the survey link was sent by the same research assistant who assigned the two-digit numbers to participating students. Consent was obtained from all participating students at the beginning of each survey. Before completing the first survey at the end of the first trimester, no coaching or instructions were given to the students on how to receive and provide feedback. Before completing the second survey at the end of the second trimester, students were coached by reading a handout on how to receive and provide constructive feedback (Appendix B). Before

completing the third and last survey at the end of the third trimester, students were coached by attending a workshop on how to receive and provide constructive feedback.

All three surveys' answers were evaluated independently by two raters, the course director and the co-course director of the course. The answers were rated as either neutral, positive, negative, or constructive feedback. Any disagreement between the two evaluators' ratings of the survey answers was discussed and agreed upon before the analysis. Answers were considered neutral feedback if there were no positive, negative, or constructive comments. Answers were considered constructive feedback if there were any suggestions to improve the course in any aspect, even if they contained any positive or negative comments. Data were collected and analyzed based on the ratings given by the two evaluators and then compared between surveys.

Statistical analysis

Kappa statistics was used to assess inter-rater reliability between the two raters. The ratings followed a nominal scale (1=neutral, 2=positive, 3=negative, 4=constructive), hence, frequency and proportions were reported for the ratings as descriptive statistics. Inferential statistical analysis was used to test rating changes over time (McNemar test). Level of significance 0.05 was used for inferential analysis with *P*-values < 0.05 reported as statistically significant. Analysis was performed combined for four questions as well as separately for each question. IBM SPSS Statistics software (version 29) was used for descriptive and inferential analysis.

Results

Of the 50 students in the class, 47 participants were included who completed all three surveys at three different time points. One student dropped the course, one refused to participate, and one failed to complete the third survey.

Two raters provided a total of 564 ratings each. Overall, 541 out of 564 ratings were matching, suggesting a 95.9% level of agreement. Kappa value was 0.941, which, being above 0.90, indicates almost perfect level of agreement. Discrepancy in data was discussed, re-evaluated, and a final agreement was reached and recorded. The following are randomly selected examples presented from students' feedback:

- Neutral feedback: "No complaints about it"
- Positive feedback: "The course provided a solid foundation in the subject matter, it was a valuable learning opportunity"
- Negative feedback: "The work was hard and tiring and the time was not enough"
- Constructive feedback: "In some anatomy lectures, clearer explanations were needed. Providing a short video would offer better visualization for students"

Within-subject analysis was conducted separately for each of the four questions in the three surveys. No significant changes were observed between survey #1 and #2 in any of the 4 questions separately or combined. However, there were statistically significant changes between

survey #1 and #3 with regards to increase in proportion of constructive ratings for questions 2-4 as well as for the four questions combined (Table 1).

Table 1. Ratings for each of the four questions at each of the three surveys.

Question	Rating	Survey #1	Survey #2	Survey #3
1	Neutral	10 (21.3%)	9 (19.1%)	13 (27.7%)
	Positive	4 (8.5%)	2 (4.3%)	0 (0%)
	Negative	15 (31.9%)	25 (53.2%)	9 (19.1%)
	Constructive	18 (38.3%)	11 (23.4%)	25 (53.2%)
			MN $\chi^2(5)=5.86$, $P=.32$	MN $\chi^2(5)=6.64$, $P=.25$
2	Neutral	13 (27.7%)	11 (23.4%)	11 (23.4%)
	Positive	3 (6.4%)	8 (17.0%)	1 (2.1%)
	Negative	15 (31.9%)	14 (29.8%)	1 (2.1%)
	Constructive	16 (34.0%)	14 (29.8%)	34 (72.3%)
			MN $\chi^2(6)=4.63$, $P=.59$	MN $\chi^2(5)=18.26$, $P=.003$
3	Neutral	27 (57.4%)	24 (51.1%)	15 (31.9%)
	Positive	6 (12.8%)	2 (4.3%)	1 (2.1%)
	Negative	4 (8.5%)	10 (21.3%)	6 (12.8%)
	Constructive	10 (21.3%)	11 (23.4%)	25 (53.2%)
			MN $\chi^2(6)=6.10$, $P=.41$	MN $\chi^2(5)=15.87$, $P=.01$
4	Neutral	17 (36.2%)	16 (34.0%)	12 (25.5%)
	Positive	1 (2.1%)	1 (2.1%)	2 (4.3%)
	Negative	18 (38.3%)	12 (25.5%)	8 (17.0%)
	Constructive	11 (23.4%)	18 (38.3%)	25 (53.2%)
			MN $\chi^2(5)=5.31$, $P=.38$	MN $\chi^2(4)=10.81$, $P=.03$
All 4 combined	Neutral	67 (35.6%)	60 (31.9%)	51 (27.1%)
	Positive	14 (7.4%)	13 (6.9%)	4 (2.1%)
	Negative	52 (27.7%)	61 (32.4%)	24 (12.8%)
	Constructive	55 (29.3%)	54 (28.7%)	109 (58.0%)
			MN $\chi^2(6)=5.28$, $P=.51$	MN $\chi^2(5)=33.43$, $P<.001$

Note: MN = McNemar test to examine change from survey #1

Table 2 shows the proportion of constructive versus non-constructive (positive, negative or neutral) ratings for each question and for all four questions combined. A significant increase in the proportion of constructive ratings was found between survey #1 and survey #3 for questions 2-4 as well as for the four questions combined.

Table 2. Proportion of constructive ratings

Question	Rating	Survey #1	Survey #2	Survey #3
1	Non-constructive[1]	29 (61.7%)	36 (76.6%)	22 (46.8%)
	Constructive	18 (38.3%)	11 (23.4%)	25 (53.2%)
			MN(b) *P*=.19	MN(b) *P*=.23
2	Non-constructive[1]	31 (66.0%)	33 (70.2%)	13 (27.7%)
	Constructive	16 (34.0%)	14 (29.8%)	34 (72.3%)
			MN(b) *P*=.83	MN(b) *P*<.001
3	Non-constructive[1]	37 (78.7%)	36 (76.6%)	22 (46.8%)
	Constructive	10 (21.3%)	11 (23.4%)	25 (53.2%)
			MN(b) *P*=1.00	MN(b) *P*=.003
4	Non-constructive[1]	36 (76.6%)	29 (61.7%)	22 (46.8%)
	Constructive	11 (23.4%)	18 (38.3%)	25 (53.2%)
			MN(b) *P*=.14	MN(b) *P*=.01
All 4 combined	Non-constructive[1]	133 (70.7%)	134 (71.7%)	79 (42.0%)
	Constructive	55 (29.3%)	54 (28.7%)	109 (58.0%)
			MN(b) *P*=1.00	MN(b) *P*<.001

Note: [1] non-constructive ratings include positive, negative and neutral
MN(b) = McNemar test using binomial distribution to examine change from survey #1

For each question, the change from survey #1 was coded as desired versus not desired. Desired change was defined as any change from positive, negative or neutral to constructive. All other changes were coded as not desired. The proportion of desired changes is summarized in Figure 1. Survey #3 showed a higher proportion of desired changes compared to survey #2. For the four questions combined, 20.2% had desired changes at survey #2 and 41.5% at survey #3 compared to survey #1. In survey #3, the most frequent changes reported overall for the four questions combined were: neutral to constructive (17.6%), negative to constructive (16.5%) and constructive to constructive (16.5%).

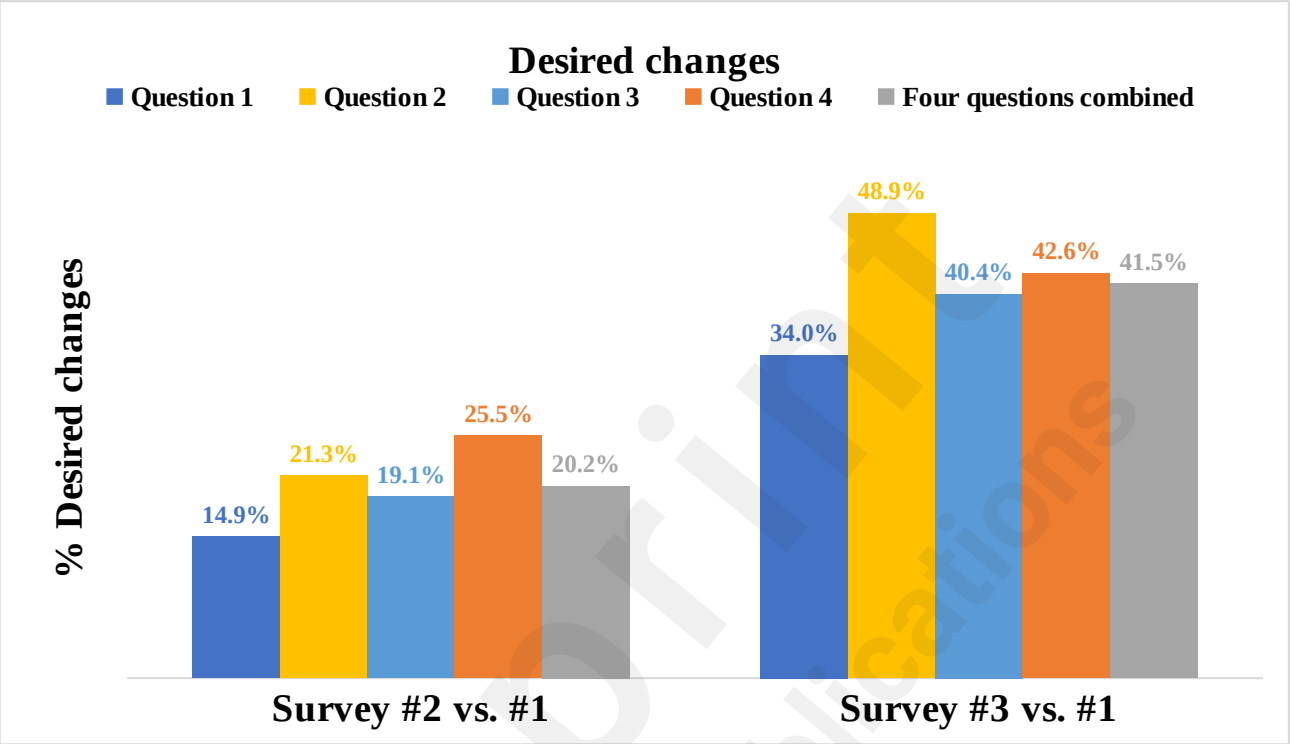

Figure 1. The proportion of desired changes in surveys #2 and #3 compared to survey #1. Desired changes were defined as any change from positive, negative or neutral to constructive.

Discussion

Principle Findings

This study compared student responses without coaching, coaching using a feedback handout or coaching using a feedback workshop before completing the surveys. Results demonstrate that handout coaching showed no significant difference compared to no coaching with respect to the number of neutral, positive, negative or constructive ratings. However, workshop coaching significantly increased the number of constructive ratings ($P<.001$, Table 1). Therefore, the null hypothesis was rejected. The reason for these results could be due to the fact that handouts were distributed to the students, and they were asked to read the one-page document independently. There was no measure of whether the students in fact read the handout and/or grasped the information. Workshop coaching, on the other hand, was done in a classroom setting with one faculty member present, ensuring a 100% attendance rate of all participating students. Furthermore, the students were able to ask questions regarding the information presented in the workshop and were asked to fill out survey #3 immediately after the workshop, before leaving the classroom.

The proportion of constructive feedback, compared to non-constructive feedback, significantly increased after workshop coaching (Table 2). The workshop-based format provided multiple examples, whereas the handout only stated the description of proper feedback writing. The educational value of workshop coaching has been previously established, wherein the students are “active learners” and can engage in asking questions during the learning process [22, 23].

Moreover, the key learning points are emphasized during the workshop, and audio-visual learning is more likely to keep the students more attentive and engaged in the content being delivered [24]. This is also demonstrated in Figure 1, where the most frequently reported changes in feedback from survey #1 (no coaching) to survey #3 (workshop coaching) were from neutral and negative to constructive, reported in this study as “desired changes”.

Comparison With Previous Work

In any educational environment, student satisfaction is an important criterion for the assessment of quality [25]. Student evaluations of teaching (SETs) are surveys typically used to collect, analyze, and interpret teaching quality [26]. Hence, every year, students are asked to evaluate the course material and provide their feedback. In the current study, the questions in the surveys provided to the students were concerned with the lectures, practical sessions and examinations at KSAU-HS. They were distributed immediately after the end of each trimester to ensure the feedback was relevant and firsthand. The purpose of these distributed surveys was to gather information on the course teaching, practical sessions and facilities, so that an action plan may be set to ensure improvement. However, most student feedback tends to be general or rely on their personal experience rather than providing helpful information related to the learning experience [27]. As this study is based on open-ended questions, analyzing responses can be quite intricate unless the process is made more structured. Hence, this study evaluated student responses after handout and workshop coaching.

Written comments add value to both students and educators when compared to scale-type questions [28]. The students are given the possibility to explain their perspective beyond Likert-type scales and raise further topics that may not have been covered in closed-ended questions [29]. Written comments are more informative for educators, and suggestions are beneficial when compared to receiving a statistical summary of quantitative results [30]. SET instruments can be a source of valuable thoughts from students and can help educators gain insight into how students perceive their learning experience and how different students learn best in a given setting [31]. However, these benefits can only be reliable after bringing a little order to the chaos of written responses.

The main purpose of the study was to improve the quality of feedback provided by the students. The workshop was able to improve the constructive criticism given by the students compared to self-learning using the handout. It is likely that the lower performance with handout coaching reflected less motivation, responsibility, or independence of the students [32]. These results are contrary to a previous similar study, in which both the handout and workshop coaching similarly improved student feedback [33]. The difference in results could be attributed to the nature of the dental school between both studies. This study was performed in a governmental dental school where students are not obliged to pay tuition fees. On the contrary, since their education is financed largely by loans, students from the Canadian private dental school may be more encouraged to commit to assigned tasks [34]. It is also worth noting that dental students at our institution are more familiar with lecture- and workshop-based learning as opposed to self-directed learning.

Limitations

One of the limitations of this study was the inclusion of only first year students, as students in older years may have responded differently to the handout coaching, likely being more familiar with independent self-learning. Furthermore, the difference between the topics covered over the

three trimesters of the course may have influenced the feedback given by the students. Lastly, when the students were given the third survey, they had already been exposed to both handout and workshop coaching on proper feedback, and this emphasis on appropriate feedback writing may have led to the higher number of constructive comments in survey #3.

Conclusions

Within the limitations of this study, it can be concluded that workshop coaching of dental students on proper feedback writing in response to open-ended questions was beneficial in improving the proportion of constructive feedback. The open-ended nature of the SET questions can potentially be used to extract keywords for analysis of the degree of polarity in the text and detect certain themes in the comments made by students. If included in dental school curriculums, feedback coaching could help students better express their concerns and proper analytics could allow educators to organize the seemingly challenging comments, ultimately improving the learning experience for students.

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Supplementary Files