ADVANCING THROUGH INNOVATION

Massive online open course on pediatric dentistry for senior undergraduates during COVID-19 pandemic

Ece Eden DDS, PhD1  |  Elif Kuru DDS, PhD2

1 Department of Pediatric Dentistry, Ege University School of Dentistry, Bornova, Turkey
2 Department of Pediatric Dentistry, University School of Dentistry, Usak, Turkey

Correspondence
Elif Kuru, School of Dentistry, Faculty of Pediatric Dentistry, Usak University, Merkez/Usak 64200, Turkey.
Email: h.elifkuru@gmail.com

1 | PROBLEM

Since many governments have abolished in-person education as a consequence of the COVID-19 pandemic, online dental education is essential. To improve students’ critical thinking skills, case-based evaluations, visual materials, and engaging activities are recommended.1 It will be beneficial to use an online education platform that allows students to be involved in education by their own pace, using videos, lectures, notes, and articles.

2 | SOLUTION

The aims were to evaluate the effectiveness of a novel “pediatric dentistry” Massive Open Online Course (MOOC), as well as to evaluate suggestions for improvement. Volunteer senior students participated in the study (n = 27). All of the remaining students have participated in the training in terms of educational equality in subsequent months.

Course materials included asynchronous seminars, four lectures from foreign researchers, written lecture notes and articles, video recordings, assignments, quizzes and live question, and answer sessions. For data collection, pretests and posttests were used. A questionnaire with five open-ended questions, and 10 statements that define the characteristics of the education module assessed using the Likert scale, was used to collect comments and expressions about the educational features of the program. Statistical analysis was done using the Wilcoxon test for pre- and posttest findings and content analysis on answers to open-ended questions.

3 | RESULTS

There was a statistically significant increase in correct answers to test questions (p < 0.05). The average score of the pretest was 59.35, and the average scores of the posttest increased to 77.20 within 1 month.

The data obtained from the Likert scale and open-ended questions were classified separately. Average scores, standard deviation, median, and the range of the Likert scale scores for each statement were calculated (Table 1).

All comments to the open-ended questions were first categorized into different groups using occasional words or the implication of the sentence (manifest content analysis).2 The relative frequency of the themes using quantitative approach is listed in Table 2. Content analysis with themes revealed that the course was found effective and suggestions such as enriching the visual content, improving the interaction, and adding more case discussions were made.

The students suggested increasing the number of videos with new topics including root canal treatment for primary teeth and managing molar incisor hypomineralization lesions. One student stated that “the lectures presented as video tutorials contribute[d to] our limited clinical experience” (woman dental student, age 22). Students find it extremely beneficial to watch video lectures from professors from various countries who are recognized as experts in their fields. Although the video descriptions were more educational than the written documents, the students claimed that the written documents created from both Turkish and English current articles are useful because they are archivable and up to date. When asked...
TABLE 1  Average scores of the Likert scale for each statement

| Statement                                                 | Average score | Standard deviation | Median | Range |
|-----------------------------------------------------------|---------------|--------------------|--------|-------|
| The course fulfilled my expectations in general           | 4.56          | 0.6                | 5      | 2     |
| The content of the course fulfilled my expectations       | 4.56          | 0.5                | 5      | 1     |
| Written education documents were sufficient                | 4.70          | 0.5                | 5      | 1     |
| Video contents were sufficient                             | 4.70          | 0.5                | 5      | 1     |
| Live interactive Q&A sessions were satisfying             | 4.51          | 0.5                | 5      | 2     |
| Weekly assessments were compatible with the content       | 4.81          | 0.4                | 5      | 1     |
| Assessment techniques used at the end of each week were suitable | 4.67          | 0.5                | 5      | 1     |
| The duration of the course was adequate                   | 4.29          | 0.7                | 4      | 2     |
| This course contributed to my professional competency    | 4.74          | 0.5                | 5      | 2     |
| The number of such courses in dental education should be increased | 4.89          | 0.3                | 5      | 1     |

TABLE 2  Identified themes based on the answers of the open-ended questions

| Open-ended questions                              | Themes                                  | Number of students |
|--------------------------------------------------|-----------------------------------------|--------------------|
| What can be added to the content of the course?  | • More videos                           | 7                  |
|                                                  | • Clinical cases                        | 5                  |
|                                                  | • Synchronized interactive sessions     | 2                  |
| What should be done to improve the educational impact of the course? | • Extent the duration                   | 5                  |
|                                                  | • More topics                           | 5                  |
|                                                  | • More quizzes or homework              | 4                  |
|                                                  | • More feedback                         | 3                  |
| What do you think about the videos and foreign lecturers? | • Impressive                           | 15                 |
|                                                  | • Add subtitles                         | 3                  |
| What do you think about the written documents?   | • Reliable                              | 5                  |
|                                                  | • Archivable                            | 5                  |
|                                                  | • Explanatory                           | 5                  |
|                                                  | • Evidence-based                        | 4                  |
| What are your suggestions for improving the course? | • More content of different topics      | 8                  |
|                                                  | • More tutorial videos on different treatments and clinical cases | 7                  |
|                                                  | • Synchronized interactive sessions for case discussions | 4                  |
|                                                  | • Improve personal feedback             | 3                  |
|                                                  | • More written document                 | 3                  |
|                                                  | • Subtitles for videos                  | 2                  |

for suggestions to improve the course, the most common responses were to make it on more subjects and to include more written documents and mini-quizzes at the end of each lesson.

The “pediatric dentistry” online education program of MOOCs has contributed on the learning experience of the senior students on the given lectures. The students were satisfied and enthusiastic about the module and suggested its use for other disciplines. MOOCs may be used as an effective tool for dental education and have the flexibility for improvement according to the students’ needs.

ORCID
Elif Kuru DDS, PhD © https://orcid.org/0000-0002-0396-7677

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