



Examination performance of dentistry students during the COVID-19 pandemic

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ABSTRACT

Objective: The global COVID-19 pandemic has led to an increase in remote teaching and online assessment in higher education. The examination performance of undergraduate students of dentistry was evaluated to assess any possible association between the altered learning environment and learners' performance.

Materials and methods: Using administrative data from the University of Helsinki, the examination performance during the years 2018 and 2019 was compared with that of 2020.

Results: In 16 out of 22 courses (73%) taught remotely during the pandemic, a statistically significant difference ($p < .05$) between the awarded grades was observed, as compared to the two previous years. Annual variation in examination grades was common even before the onset of remote teaching, but more so after it. The grade variation during the pandemic was nearly as prevalent towards falling grades (26%) as towards rising grades (36%), implying a multifactorial cause possibly unrelated to remote teaching.

Conclusions: Our results imply that online teaching did not systematically improve or worsen the examination performance of undergraduate students of dentistry. Our findings have important policy implications for educational practices in the future. The observed annual grade variation might reflect the effectiveness of remote teaching, changes in students' performance, or non-systematic grading.

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Introduction

The COVID-19 pandemic fundamentally reshaped dentistry education. Academic units were forced to adopt alternative teaching strategies and begin using digital teaching tools without prior planning or trial runs [1]. During the pandemic lockdown, alternative assessment methods, such as open-book examinations, were adopted in some universities [2]. Assessment promotes learning by providing constructive feedback to advance the learning process [3]. Summative assessment methods, such as examinations, evaluate knowledge as described in the base of Miller's framework pyramid and in Bloom's taxonomy as the remembering and understanding competence level [4,5]. In medical education summative assessment plays a vital role both in assessing competence and in enhancing students' learning [3,6].

In dentistry, clinical skills training requires close interpersonal contact. Dependence on hands-on training results in particular challenges for online dental education [1]. Virtual resources may facilitate the learning process by providing accurate, necessary, and easily accessible information, but the disadvantages of remote learning include the lack of infrastructure and materials, apart from supervision, to promote progressive personal growth and development in becoming a dentist and treating patients [7]. However, previous studies, based on questionnaire surveys among dentistry

students, have suggested that a blended learning approach delivers an equally good learning efficiency [8,9]. Similarly, online assessment has been shown to improve medical students' academic achievement in both theoretical and practical assessment [10]. The underlying reason has been stated to be in good reliability, a better discrimination ability, and easier implementation as compared to paper-based examinations [10]. The observed improvement in multiply choice question assessment reliability might be attributed to a computer eliminating human errors [10].

In March 2020, the University of Helsinki, in the capital region of Finland, suspended most contact teaching and shifted to a hybrid approach. In the Faculty of Medicine, the unit responsible for dentistry education meant that face-to-face instruction, including pre-clinical and clinical activities, was considerably reduced. All lecture-based learning and some practice tutorials were delivered online, while most simulation laboratory courses, as well as clinical practice-based learning, were still delivered face-to-face in small groups. This division into small groups resulted in a reduced number of practice-based learning hours to accommodate all groups in the teaching schedule. Clinical practice requirements for graduation were reduced. No adjustments to the theoretical examination requirements were made intentionally. Course assessments shifted from invigilated to non-invigilated.

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Table 1. Number of dentistry students at each student-year group.

Undergraduate year	Number of enrolled students for the academic semester		
	2018–2019	2019–2020	2020–2021
1st	49	51	45
2nd	48	41	47
3rd	43	45	46
4th	45	43	49
5th	41	48	43

The objective of this study was to examine whether there is a difference in the examination performance of dentistry students after remote teaching was initiated under the lockdown caused by COVID-19, as compared to the situation before lockdown, and to explore the teachers' perspective on this performance. We hypothesized that examination scores of dentistry students were higher before remote teaching was initiated.

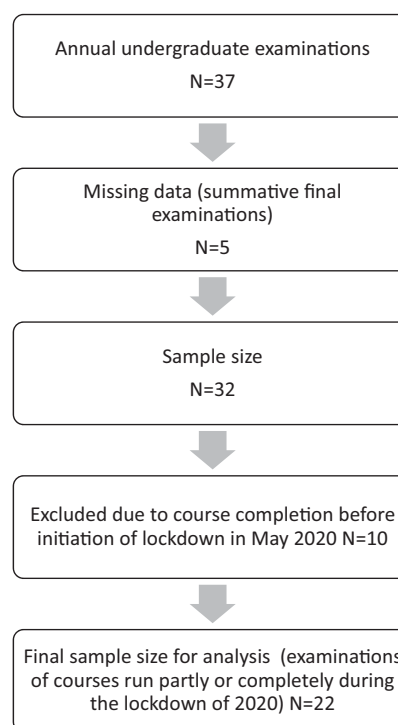
Materials and methods

Ethical approval for this mixed methods study was obtained from an institutional research ethics board (11/2021). In total, 37 course examinations for 1st to 5th year undergraduate students of dentistry (Table 1), are organized annually at the Department of Oral and Maxillofacial Diseases, Faculty of Medicine, University of Helsinki, Finland. Dentistry and medical students share a mostly conjoint curriculum for their first two years of study. At the University of Helsinki, the academic year begins in August and ends in May.

Quantitative data was gathered from anonymous records of the student services office and the open examination results database of the university's learning platform Moodle. The intended sample size included all the examination results of the examined years. Information on the examination results from the years 2018, 2019, and 2020 were available for 32 out of 37 course examinations (86%) (Figure 1). Eventually, 22 course examinations for courses run partly or completely during the lockdown of 2020 were included in the final sample. In all the courses examined, the examinations were traditional paper-based theoretical examinations in 2018 and 2019, and all but seven were held as e-examinations in 2020. Four of the courses for 1st and 2nd year students were held jointly for medical and dentistry students. Before 2020, the courses consisted of mixed pedagogical strategies; interactive didactic teaching, case-based teaching sessions, and practice-based sessions.

Of the examinations, 18 (81%) were graded from 0 to 5, where 0 represented a failed result and 5 was the highest grade. Grades were given based on course content criteria. In total, four courses (18%) were graded pass/fail. The examination performance of undergraduate students during the years 2018 and 2019 were compared against the 2020 examination results to assess the association, and thereby possible impact, of a changed learning environment on learners' performance in an evaluation.

Qualitative data consisted of an anonymous online survey presented to all the teachers of the Department of Oral and Maxillofacial Diseases ($N=41$). The questionnaire, consisting of 14 open- and close-ended questions, was constructed for

**Figure 1.** Sample size flow chart.

this study to explore the teachers' views on any possible changes that the pandemic had brought about in their evaluation practices (Appendix). The validity of the qualitative analysis was established using two measures: inclusion of the whole target population in the plan and respondent blinding. To establish reliability, all the recorded data were gathered in a table for mixed-methods analysis. Qualitative data analysis consisted of theme analysis and quantitative data were analyzed statistically.

The Kolmogorov-Smirnov test was applied to test for normality of the data distribution. A Mann-Whitney U test and Kruskal-Wallis H test were conducted to compare numeric examination grades' mean ranks between the years 2018, 2019, and 2020. A chi-square test was used to compare the pass/fail-grade distribution for the three years examined. A Spearman rank correlation was calculated to evaluate the strength of the association between examination grades and their years of origin. Statistical significance was set at $p < .05$ level. Statistical analyses were performed using SPSS software (version 25.0; SPSS Inc., Chicago, IL, USA).

Results

Of the 22 examinations graded numerically from 0 to 5, the difference in the grade distribution between 2018 and 2019 was statistically significant in nine examinations (41%) either towards increased or reduced grade scores (Tables 2–4). The difference in the grade distribution between 2019 and 2020 was statistically significant in 12 examinations (55%). The difference in the grade distribution between 2018 and 2020 was statistically significant in 13 examinations (59%). In total, examinations grades displayed a statistically significant

difference between the assessed years in 78% of the 1st and 2nd study year courses, and in 57% of the 3rd to 5th study years.

None of the numerically graded examinations displayed a statistically significant difference in the number of students failing or in the number of students with the highest grade across the examined years. Similarly, none of the four pass/fail examination results displayed a statistically significant difference between the examined years in the number of students passing the examination.

The mean examination grade for 2020 had improved statistically significantly in nine courses (41%) compared to the

previous year (Table 4). The mean examination grade for 2020 was statistically significantly lower in five courses (23%) compared to the previous year.

A weak but statistically significant positive correlation was found between the examination grades of seven courses and the year the examinations were taken, indicating higher grades in 2020 compared to previous years. A weak but statistically significant negative correlation was found between the examination grades of five courses and the year they were taken, indicating lower grades in 2020 compared to previous years. Table 4 outlines these associations.

In one course, the teacher, who also graded the examinations, had changed during the assessed years. A statistically significant ($p < .05$) difference was present in the examination grades of the course in question. The course contents and lecture material had remained unchanged for the most part for all evaluated courses.

The questionnaire response rate was 41% (17 respondents). The age of respondents varied between 40 and above

Table 2. Number and (percentage) of statistically significant differences in examination grade distributions between the evaluated years.

Year	2018–2019	2018–2020	2019–2020
Total number of significant findings	9/22(41%)	13/22(59%)	13/22(59%)
1st and 2nd year course examinations	6/9(67%)	5/9(56%)	6/9(67%)
3rd to 5th year-course examinations	3/13 (23%)	8/13(62%)	7/13(54%)

Number of examinations is 22. Statistical significance level $p < .05$.

Table 3. Pairwise comparison of the examination result means between the evaluated years and the association between the examination grade and the evaluation year.

	Course	2018–2019	2018–2020	2019–2020
1st and 2nd year course examinations	Tissues [#]	$u(376) = 14,557.5$ $p = .001^*$	$u(368) = 16,619.5$ $p = .689$	$u(365) = 13,171$ $p < .001^*$
	Nervous system [#]	$u(368) = 14,445$ $p = .027^*$	$u(383) = 15,719.5$ $p = .017^*$	$u(349) = 13,296.5$ $p = .029^*$
	Respiratory system [#]	$u(392) = 17,516.5$ $p = .095$	$u(395) = 14,329$ $p < .001^*$	$u(384) = 15,926$ $p = .013^*$
	Digestive system [#]	$u(388) = 18,598.5$ $p = .761$	$u(391) = 14,412$ $p < .001^*$	$u(392) = 13,835$ $p < .001^*$
	Dental genetics	$u(96) = 341.5$ $p < .001^*$	$u(87) = 931$ $p = .748$	$u(98) = 270.5$ $p < .001^*$
	Drug and radiation safety	$u(96) = 579.5$ $p < .001^*$	$u(90) = 542.0$ $p < .001^*$	$u(97) = 1096$ $p = .450$
	Antimicrobial drugs	$u(97) = 833.5$ $p = .005^*$	$u(89) = 945.5$ $p = .567$	$u(97) = 955.0$ $p = .063$
	Pathology	$u(96) = 801.0$ $p = .005^*$	$u(91) = 666.0$ $p = .001^*$	$u(92) = 505.5$ $p < .001^*$
	Laboratory medicine	$\chi^2 = 0.021$ $p = .886$	$\chi^2 = 1.011$ $p = .315$	$\chi^2 = 0.826$ $p = .363$
	3rd to 5th year-course examinations	Orthodontics	$u(83) = 677.5$ $p = .066$	$u(85) = 772.5$ $p = .211$
Microbiology		$u(87) = 502.5$ $p < .001^*$	$u(93) = 694.0$ $p = .001^*$	$u(97) = 1021$ $p = .177$
Occlusion		$u(83) = 495.5$ $p < .001^*$	$u(83) = 248.5$ $p < .001^*$	$u(91) = 772.5$ $p = .016^*$
Oral diseases		$u(87) = 679.0$ $p = .010^*$	$u(87) = 130.5$ $p < .001^*$	$u(93) = 207.0$ $p < .001^*$
Interpretation of radiographs		$\chi^2 = 1.10$ $p = .293$	$\chi^2 = 1.105$ $p = .293$	Same results
Medication management		$\chi^2 = 1.082$ $p = .298$	$\chi^2 = 0.988$ $p = .320$	Same results
Endodontics and periodontology		$u(86) = 805.0$ $p = .234$	$u(85) = 493.5$ $p < .001^*$	$u(92) = 717.0$ $p = .004^*$
Dental traumatology		$u(86) = 904.0$ $p = .75$	$u(92) = 698.5$ $p = .002^*$	$u(85) = 588.0$ $p = .003^*$
Cariology and endodontics		$u(87) = 857.0$ $p = .338$	$u(83) = 265.0$ $p < .001^*$	$u(87) = 264.0$ $p < .001^*$
Prosthetics and stomatognathic physiology		$u(85) = 872.5$ $p = .648$	$u(82) = 797.5$ $p = .551$	$u(86) = 921.0$ $p = .832$
Simulation laboratory of endodontics		$\chi^2 = 0.838$ $p = .658$		
Oral and maxillofacial surgery		$u(87) = 862.0$ $p = .350$	$u(85) = 709.5$ $p = .049^*$	$u(87) = 865.5$ $p = .356$
Oral healthcare		$u(86) = 845.0$ $p = .376$	$u(82) = 540.5$ $p = .002^*$	$u(87) = 676.0$ $p = .010^*$

For the year 2020, only examinations ($N = 22$) carried out during the lockdown are included.

*Difference between the evaluated years is statistically significant $p < .05$.

[#]Joint course with medical students. The examination results of students of dentistry and medicine are combined.

Table 4. Average student's grade, number of students with a failed grade, and number of students with the highest grade in traditional paper-based assessment during years 2018 and 2019 vs. e-examination assessment 2020.

Course	2018			2019			2020			Correlation
	Mean	SD	Number of failed grade	Mean	SD	Number of failed grade	Mean	SD	Number of failed grade	
First and second year course examinations										
Tissues* [#]	2.8 N=190	1.2	13	3.2 N=187	1.0	3	2.7 N=179	1.1	11	$r_s = -0.036$ $p = .393$
Nervous system [#]	2.8 N=190	1.2	15	2.6 N=179	1.5	23	2.9 N=171	1.2	11	$r_s = 0.035$ $p = .416$
Respiratory system* [#]	2.9 N=202	1.1	14	2.3 N=191	1.2	8	2.5 N=194	1.0	6	$r_s = -0.189$ $p < .001^*$
Digestive system* [#]	2.7 N=194	1.2	14	2.7 N=195	1.0	4	3.2 N=198	1.1	3	$r_s = 0.193$ $p < .001^*$
Dental genetics* [#]	3.4 N=43	1.1	1	1.8 N=54	1.0	7	3.2 N=45	0.7	0	$r_s = -0.012$ $p = .886$
Drug and radiation safety* [#]	4.1 N=45	0.9	0	3.2 N=52	1.0	0	3.3 N=46	0.8	0	$r_s = -0.342$ $p < .001^*$
Antimicrobial drugs* [#]	4.0 N=45	0.9	0	4.4 N=53	0.9	0	4.0 N=45	1.1	0	$r_s = -0.044$ $p = .595$
Pathology* [#]	3.2 N=48	0.9	0	2.2 N=49	1.9	20	3.8 N=44	1.0	1	$r_s = 0.214$ $p = .009^*$
Orthodontics* [#]	2.4 N=41	0.9	2	3.5 N=47	0.9	0	2.6 N=44	1.1	1	$r_s = 0.032$ $p = .715$
Microbiology* [#]	2.5 N=42	1.1	4	3.6 N=46	0.8	0	3.2 N=52	1.0	3	$r_s = 0.265$ $p = .002^*$
Occlusion* [#]	2.9 N=38	1.4	4	3.8 N=46	1.3	2	4.5 N=46	0.7	0	$r_s = 0.509$ $p < .001^*$
Oral diseases	4.4 N=41	1.0	2	4.0 N=47	0.8	1	2.4 N=47	0.9	0	$r_s = 0.397$ $p < .001^*$
Interpretation of radiographs* [#]	3.3 N=39	1.3	1	3.7 N=45	1.1	0	4.4 N=46	0.8	1	$r_s = -0.434$ $p < .001^*$
Endodontics and periodontology* [#]	1.9 N=40	1.1	4	2.1 N=47	1.2	7	2.8 N=46	1.0	1	$r_s = 0.346$ $p < .001^*$
Dental traumatology* [#]	2.9 N=47	1.0	1	2.9 N=40	1.1	1	2.2 N=46	1.0	2	$r_s = -0.257$ $p = .002^*$
Cariology and endodontics* [#]	2.8 N=42	1.0	0	2.9 N=46	1.0	1	1.0 N=42	1.3	22	$r_s = -0.468$ $p < .001^*$
Prosthetics and stomatognathic physiology	3.0 N=41	1.1	0	2.8 N=45	1.1	1	2.8 N=42	1.3	1	$r_s = -0.064$ $p = .468$
Oral and maxillofacial surgery	2.8 N=43	0.9	0	2.8 N=45	1.1	3	3.2 N=43	0.9	0	$r_s = 0.153$ $p = .077$
Oral healthcare* [#]	2.8 N=41	1.0	0	3.0 N=46	0.8	0	3.5 N=42	0.9	0	$r_s = 0.273$ $p = .002^*$

NA: data unavailable.

All the examinations were graded from 0 to 5, where 0 represented a failed result and 5 was the highest grade. Association between examination grade and year are presented for the courses evaluated numerically.

*Difference between the years is statistically significant as assessed by Kruskal-Wallis H Test ($p < .05$).

[#]Joint course with medical students.

Table 5. Summary of the qualitative thematic and statistical survey results for 17 teachers of dentistry.

Category	Code	Definition	Outcome	Example
Examination requirements	Easier	Grade requirements were easier during the remote teaching period		<i>More multiple-choice questions. The use of outside material was allowed.</i>
	Harder	Grade requirements were more difficult during the remote teaching period		<i>More essay-type questions</i>
Clinical skills requirements	Easier	Less required	<i>N = 10 (71%)</i>	<i>Instead of the normal 30, 20 fillings were required</i>
	No change	Clinical skills requirements remained unaltered	<i>N = 4 (29%)</i> Question unanswered by 3 teachers.	
Assessment success	Numeric evaluation	VAS scale from -4 to 4, where -4 is a strong unsuccess and 4 is a strong success	Median reported score -1 (range -4 to 2)	
Future practices	Utilizing electronic examination hereafter	Dichotomous	Yes <i>N = 8</i> No <i>N = 9</i>	<i>Applied questions and free use of source material prepares for real life. Dishonesty interferes with fair evaluation. Individual decision-making is important in this profession and possible teamwork in exams contradict this.</i>

60 years. The range of the respondents' teaching experience varied from one to more than 40 years, with an average of 15 years. Of the respondents, 14 (82%) taught both theoretical courses and at the university's student clinic. Two respondents taught solely at the student clinic, and one solely a theoretical course. In total, nine respondents (53%) deemed that in their discipline, the same number of examinations had been organized during 2020 as in the two previous years. Seven respondents (41%) reported that, according to their subjective evaluation, the number of examinations was reduced during 2020. Four respondents (24%) claimed that the examination requirements fell in 2020, while four (24%) recounted that they had remained the same, and seven (41%) claimed that the requirements were more difficult (Table 5). Two respondents left the question unanswered. Other alternative course assessment methods were used by one respondent (case-based learning and group work). Clinical requirements were lowered during 2020 according to 10 respondents (71%). Four respondents (24%) reported that the clinical requirements within their discipline had remained unaltered. On average, the teachers assessed that the assessment process had been less successful during the year 2020 as compared to previous years (Table 5).

Teachers were concerned about academic integrity and cheating. Efforts to prevent dishonesty in online examinations included limiting the access time to questions, random use of a pool of multiple-choice questions, one-way examination, and an open-book examination with a requirement for high-standard essay answers. The most utilized of these means were random order of questions (65%), limited time (47%), and open-book examination with complex questions (53%). One respondent reported not taking action to prevent dishonesty.

Of the respondents, 12 teachers (71%) had not observed academic dishonesty, whereas four respondents (24%)

suspected dishonesty due to atypical recurring mistakes in the answers of several students. One respondent left the question unanswered. In total, eight teachers (47%) stated that they would continue using online examinations as a mode of assessment in the future, and nine teachers (53%) reported that they would shift back to traditional examinations when allowed. Of the eight teachers in favour of online examinations, five were aged between 30 and 50 years, and three were aged over 50 years.

Discussion

The investigation examined 22 courses held by the Department of Oral and Maxillofacial Diseases in the Faculty of Medicine of the University of Helsinki during the years 2018, 2019, and 2020.

This study contributes to the existing literature by critically examining students' evaluation performance in higher education during the pandemic online teaching period. Our study suggests that the transition from traditional classroom teaching to online education in dentistry was successful in terms of adaptability as assessed by examination results. Teachers' perceptions of the benefits and disadvantages of online assessment were diverse. Nearly half of the teachers were determined to continue using online assessment, whereas the other half was not favouring online examinations mainly due to concerns about academic dishonesty.

Grading should be impartial and consistent [11]. For the course, in which the teacher had changed during the examined period, the observed a statistically significant difference in the examination grades was possibly affected by inter-rater differences in the assessment of perceived student performance. Although inconsistency in examination grading cannot be ruled out in our study, statistically significant differences were present in the grade distribution between the

remote learning year 2020 and both control years (2018 and 2019) more often than between the control years implying that remote learning might have affected the examination grading.

Our study hypothesis was not supported. The statistically significant examination grade variation was more prevalent towards higher marks than towards lower marks during the pandemic lockdown. We observed a tendency for a large fluctuation of examination grades of the 1st and 2nd year courses, which require lower-level cognitive skills according to Bloom's taxonomy, and a trend for overall steadier distribution of grades of the final-year courses, i.e. courses requiring higher-level cognitive skills during the pandemic year 2020. The number of students failing the examinations each year remained consistent. These findings could be argued to result from teacher's compensating for the reduction in teaching caused by COVID-19 restrictions, in the form of easier examinations. This theory, however, is inconsistent with the subjective evaluation by the teachers, many of whom considered their online examination requirements to have been more demanding. The majority of theoretical knowledge was communicated during the lectures, the number of which remained unaltered but were delivered online during the lockdown. However, reduced student group sizes in face-to-face clinical practice-based learning possibly gave more opportunities for effective individual one-on-one teaching.

Previous studies have shown that the transition in teaching from in-person lectures to online classes due to COVID-19 has had an impact on the mental health of both the academic staff and students [12–14]. Clark et al. suggest that low achievers benefit most from online learning, while there is no significant impact for top students [15]. Interestingly, among final-year medical students, online examinations appeared to be more reliable in discrimination ability, but easier than paper-based examinations [10]. Fully online distance learning did not affect the examination grades of medical students in surgery clerkship or those of business students [16,17]. However, a significant improvement was found in a single clinical OSCE score of a simulation on complex clinical skills [16]. Notably, in the above-cited studies, performance during the pandemic lockdown was compared to that of only one pre-lockdown academic year. Our study could be regarded as more reliable as two control years are considered, thus reducing the possibility of random variation.

Arias et al. [18] compared the effectiveness of teaching online vs. face-to-face and found that course objectives play an important role in determining the effectiveness of alternative teaching delivery methods. Whilst studies on online assessment have yielded promising results, the possible role of cheating in the observed academic improvement cannot be ruled out [7,10]. Academic dishonesty is a major challenge in remote examinations [19], and this concern was also raised by the respondents in our study.

In interpreting our findings, it is important to consider that assessment practices are not a homogeneous entity, but rather each teacher constructs their own requirements for each course and evaluates the examinations' essay responses

subjectively. This would explain our somewhat contradictory finding, that some teachers recount examination requirements being more difficult during the lockdown, while the grades were in fact on average higher for many courses. The higher grades might reflect an improved performance level of the students, lowered grading standards, or academic dishonesty. The reliability and validity of our qualitative analysis suffer from a low response rate to the questionnaire, which also did not make a distinction between teachers responsible for courses run before vs. during the lockdown. The uncontrolled factors that could have impacted the examination outcome in 2020 include the actual pandemic, faculty adapting the assessment to enable students to pass, as well as the technical, emotional, and intellectual challenges of transitioning from in-person learning and classroom examinations to online.

Within the limitations of this study, we conclude that considerable annual variation was present in the examination scores of undergraduate dentistry students regardless of teaching modality. The variation was, however, more pronounced during the pandemic lockdown. The observed variation in summative assessment outcomes might be due to student performance, quality of teaching, or assessors' judgement-related differences. Further research is needed to evaluate the causal impacts of online teaching in dentistry. Nevertheless, our findings imply that the innovative digital educational strategies, brought on by the rapid shift to online learning, might be successful in promoting learning in dentistry students.

Disclosure statement

No potential conflict of interest was reported by the author(s).

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- a. Preclinical phase students (Years 1 and 2) (Please answer questions 4–9 and 13–15)
- b. Clinical phase students (Years 3–5) (Please answer questions 10–15)
- c. Both (Please answer all the questions)
4. Please list all the course assessments you have made during academic years 2019 and 2020
5. The number of exams you have held during the year 2021 as compared to the previous year has been
- a. Same
- b. Less
- c. More
6. Have the exam requirements been modified with remote exams?
- a. No
- b. Yes, mainly easier
- c. Yes, mainly more difficult
- Please explain how?
7. Have you used an alternative course assessment method besides e-exams?
- a. No
- b. Yes
- Please give an example?
8. By which methods have you attempted to prevent academic dishonesty?
- a. I haven't made any special arrangements
- b. Random order of the questions
- c. One-way exam
- d. By giving less time to complete the exam
- e. Limited time for each question
- f. Open-book exam with more challenging questions
- g. Other methods?
9. Have you detected academic dishonesty or cheating in exams?
- a. No
- b. Yes, how:
10. Assessment of clinical courses I have participated in during 2019 and 2020?
11. Have you altered the assessment methods of clinical skills performance? If so, please explain how:
12. Have you altered the clinical skills performance requirements during the COVID-19 pandemic?
- a. No
- b. Yes, easier requirements
- c. Yes, more difficult requirements
- Please specify how?
13. Do you think the assessment of students has been successful during the COVID-19 pandemic?
14. Do you intend to continue using e-exams after going back to face-to-face teaching?
- a. No
- b. Yes
- Please specify the reasons for your decision?

Appendix

1. Age
 - a. 20–30
 - b. 30–40
 - c. 40–50
 - d. 50–60
 - e. 60–70
2. Number of teaching experience years
3. I teach