

Original Research

Undertaking a face-to-face objective structured clinical examination for medical students during the COVID-19 pandemic

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Abstract

Introduction and aims: Objective structured clinical examinations (OSCEs) play a pivotal role in medical education assessment. The Advanced Clinical Skills (ACS) OSCE examines clinical skills in psychiatry, general practice, obstetrics and gynaecology and paediatrics. This study examined if the 2020 ACS OSCE for fourth year medical students attending the National University of Ireland, Galway, was associated with any significant result differences compared to the equivalent 2019 OSCE. Additionally, we assessed students' satisfaction and explored any organisational difficulties in conducting a face-to-face OSCE during the COVID-19 pandemic.

Materials and methods: This study compared anonymised data between the 2019 and 2020 ACS OSCEs and analysed anonymised student feedback pertaining to the modified 2020 OSCE.

Results: The mean total ACS OSCE result achieved in 2020 was statistically higher v. compared to the 2019 OSCE [62.95% (SD = 6.21) v. 59.35% (SD = 5.54), $t = 6.092$, $p < 0.01$], with higher marks noted in psychiatry ($p = 0.001$), paediatrics ($p = 0.001$) and general practice ($p < 0.001$) with more students attaining honours grades ($\chi^2 = 27.257$, $df = 3$, $p < 0.001$). No difference in failure rates were found. Students reported feeling safe performing the 2020 OSCE (89.2%), but some expressed face-mask wearing impeded their communication skills (47.8%).

Conclusion: This study demonstrates that conducting a face-to-face OSCE during the pandemic is feasible and associated with positive student feedback. Exam validity has been demonstrated as there was no difference in the overall pass rate.

Keywords: Objective structured clinical examination (OSCE); COVID-19; Pandemic; Medical students

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Introduction

Objective Structured Clinical Examinations (OSCEs) play a pivotal role in medical education and assist evaluating the “show how” component in Millers Pyramid of assessment (Gormley 2011). This assessment methodology is frequently used to evaluate medical students' suitability to progress onto medical qualification both at undergraduate and at post-graduate level (Newble 2004; Zayyan 2011). OSCE's however are associated with significant organisational challenges, especially during the current worldwide COVID-19 pandemic (Wooliscroft, 2000).

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COVID-19 was characterised as a pandemic by the World Health Organisation (WHO) on March 11th 2020 (World Health Organisation, 2021). The declaration was followed by the implementation of worldwide restrictions. In Ireland, restrictions included the closure of facilities deemed “non-essential” and resulted in the discontinuation of face-face teaching in universities on March 12th 2020. Thus, all medical students were advised that on-going education was to pivot “on-line” with clinical attachments transferred out of hospital and university settings. These changes had a significant impact on examining students in clinical skills, including in psychiatry and resulted in OSCEs being deferred including the Year 4 (4 MB) OSCE at the National University of Galway (NUI Galway), Ireland

Traditionally 4 MB medical students at NUI Galway rotate through a number of specialities (Psychiatry, General Practice, Obstetrics and Gynaecology and Paediatrics), with a particular focus on clinical skills which are examined as part of the Advanced Clinical Skills (ACS) module. Historically, the assessment of the learning objectives and skills were assessed via a summative OSCE, which in 2019 included 16 stations of 10 minute durations

Table 1. Changes implement in the modified live 2020 ACS OSCE

Implemented circuit changes	<ul style="list-style-type: none"> • Reduction in OSCE station number from 16 to 4 stations • Increase in duration of each OSCE station from 10 to 14 minutes • Increase in time-gap between OSCE station examinations (1–3 minutes to allow cleaning of rooms and equipment between each student). • Circuits of five students instead of 14 to reduce number of individuals in any location • Increase in the number of concurrent circuits (from 3 to 6) to reduce the number of individuals in any location. Concurrently, 4–6 circuits ran per session (three in Galway, and three in the NUI Galway Academies at Castlebar, Sligo and Letterkenny).
Implemented administrative changes	<ul style="list-style-type: none"> • Segregation of students with no corraling of students (this required that each circuit had different station material) • Segregation of examiners with no congregated breaks (i.e. lunch) and packed lunches were provided to each examiner in their room. • To ensure marking consistency all OSCE stations were examined by experienced examiners who had training by a “lead examiner” for each station prior to the OSCE.
Implemented special COVID-19 measures	<ul style="list-style-type: none"> • Mandatory wearing of face-masks for all participants (examiners, students, administrative staff and simulated patients) • Alteration of some clinical stations to ensure social distancing, with no clinical stations requiring physical examination of a person – mannequins utilised instead. • Temperature checks on all students, administrators and examiners prior to examination • Travel declarations for all students, examiners and administrators (i.e. that 14 days of quarantine had been completed prior to attending the examination if individual had recently travelled) • Health declarations for all examination attendees relating to symptoms of COVID-19 • Strict regulations regarding personal hygiene, hand sanitation and social distancing.

split over 2 days. For students to progress to their final year (5 MB), students are required to pass the ACS module. Consequently, despite the logistical difficulties caused by the COVID-19 pandemic and its’ associated restrictions, an OSCE examination was required for 4 MB students, to assess their attainment of mandatory learning outcomes only attainable in a clinical examination format.

University institutions who have proceeded with OSCEs during the COVID-19 pandemic have utilised either an adapted virtual OSCE assessment (Lara *et al.* 2020; Kakadia *et al.* 2020), or a modified COVID-19 compliant live OSCE (Darling-Pomranz *et al.*, 2020; Boursicot *et al.* 2020). Positive feedback from stakeholders in particular has been noted with modified live OSCEs, albeit careful planning and circuit modification being required (Darling-Pomranz *et al.*, 2020; Boursicot *et al.* 2020). On-line examinations have also yielded largely positive feedback; however, technical issues have emerged as a specific challenging feature (Kakadia *et al.* 2020).

On August 26th and 27th 2020, when the first COVID-19 peak had subsided in Ireland, the ACS committee decided to proceed with a modified live OSCE for 4 MB students, based on 1) the mandatory requirement for students to pass learning outcomes pertaining to this module to proceed into final year and 2) due to previous positive, albeit preliminary reports of modified face-to-face OSCEs (Darling-Pomranz *et al.*, 2020; Boursicot *et al.* 2020). Modifications to the ACS module for the 2020 OSCE are detailed in Table 1. The OSCE consisted of each discipline creating one station of 14 minutes instead of four 10 minute stations per discipline. Of note, otorhinolaryngology is examined as a component of the general practice discipline. Each of the discipline stations assessed distinct learning objectives. The 14 minute time period was chosen to enable all learning outcomes based upon the blueprint of the ACS module to be examined and in line with Medical Council guidelines (Council IM 2012) (see Table 2), with this increased time period allowing additional tasks to be examined. For example, in psychiatry, OSCE stations were chosen that were adapted from previous years, with three tasks examined compared to two previously. This time-period ensured less than 15 minutes of contact occurred between simulated patients and the students being examined. The number of exam circuits increased from three to six circuits, reducing the number of students, examiners and invigilators in any location.

Experienced examiners were recruited to ensure marking standardisation. As less examiners were required for this exam, due to the reduced number of OSCE stations compared to previous OSCEs, we were able to ensure that all examiners, had examined previously in other ACS OSCE examinations in their discipline of interest. In addition, each discipline held examiner briefing sessions prior to the OSCE, and during the OSCE, on-going monitoring of marks across centres was undertaken to ensure minimal discrepancies in marks occurred due to examiner differences, with a lead examiner identified for each station monitoring same. Each of the seven learning outcomes was examined in at least two OSCE stations, with communication examined in each of the four OSCE stations. The psychiatry stations also examined history taking and management (see Table 2).

There were no congregated breaks at any exam location and several measures were incorporated to ensure COVID-19 guidelines were maintained throughout the examination. As previous conducted studies predominantly focused on the feasibility of conducting an OSCE during the COVID-19 pandemic, this study primarily focused on student performance compared to the previous years’ face-to-face examination. Consequently, the aims of this study were: (1) to ascertain if the ACS 2020 OSCE was associated with any significant differences in results compared to the equivalent 2019 OSCE examination for both the entire OSCE and for the discipline sub-components of the OSCE; Psychiatry, General Practice, Obstetrics and Gynaecology and Paediatrics, (2) to assess students’ satisfaction with this modified examination, and (3) to explore if conducting a face-to-face examination during the COVID-19 pandemic was associated with any organisational difficulties.

Methods

Participants involved in this study included all 4 MB medical students sitting the ACS OSCE for the first time, in either 2019 or 2020. All data relating to exam performance were anonymised and securely stored and handled in accordance with the Data Protection Act, 2018. Ethical approval was attained from

the Galway University Hospitals Research Ethics Committee (C.A.2351).

Data pertaining to metrics from the 2019 and 2020 OSCE respectively were retrieved from Observe software (Qpercom Ltd, 2020), which is only available to members of the ACS committee.

Students' anonymised subjective experience of the modified OSCE was measured utilising a study-specific 7-item questionnaire (see Appendix 1). This questionnaire examined data pertaining to students experience and sense of safety on the examination site and communication relating the OSCE. A free-text box was also incorporated allowing students to provide additional data relating to their subjective experience of this assessment.

Statistical analysis was conducted utilising the Statistical Package for Social Sciences 26.0 for Windows (SPSS Inc., IBM, New York, USA). Descriptive analyses (frequencies, means and standard deviations) were attained for all quantitative data (i.e. total OSCE result and scores attained from each OSCE station and each medical discipline) with data checked to ascertain if normally distributed. The student-*t* test was utilised for parametric data and the Chi square (χ^2) test was utilised for categorical data (comparison of number of students attaining different grades [first class honours ($\geq 70\%$), second class honours (60–69%), pass (50–59%) and fail (<50%)]. Likert scale data from this anonymized feedback were compared utilising χ^2 or Fisher's exact data as appropriate. Free-text data from the questionnaire were examined and open-coded based on the framework of the questionnaire.

Results

OSCE metrics

Each OSCE included 200 students. The mean total ACS score in the 2020 OSCE was statistically higher [62.95 (SD = 6.21) vs. 59.35% (SD = 5.54), $t = 6.092$, $p < 0.01$] compared to 2019. Three of the disciplines [Psychiatry ($t = 5.207$, $p = 0.001$), General Practice ($t = 8.549$, $p < 0.001$) and Obstetrics and Gynaecology ($t = 3.397$, $p = 0.001$)] demonstrated higher marks statistically in the 2020 OSCE compared to the 2019 OSCE (see Table 2). The Cronbach Alpha result for the 2020 OSCE was 0.796 vs. 0.777 in 2019.

On examining individual grades, the 2020 OSCE demonstrated a statistical difference compared to the 2019 OSCE ($\chi^2 = 27.257$, $df = 3$, $p < 0.001$). Post-hoc analysis revealed more students attained H1 grades in 2020 compared to 2019 (11.5% vs. 1.0%, $\chi^2 = 18.816$, Fisher's exact $p < 0.001$) with less students attaining pass grades in 2020 compared to 2019 (29.0% vs. 46.5%, $\chi^2 = 13.032$, $p < 0.001$). There was no statistical difference in the number of students failing the OSCE in 2020 compared to 2019 (3.0% vs. 4.0%, $\chi^2 = 0.296$, $p = 0.586$).

Finally, when analysing the station competencies; the mean score for communication in the 2020 OSCE (whereby both students and simulated patients were mask wearing) was 61.3% compared to 64.8% in 2019.

Questionnaire data

There was a 46.5% ($n = 93$) response rate to the electronic anonymous feedback questionnaire distributed to 4 MB students who had recently completed the 2020 OSCE (see Table 3). Of students who responded; the majority felt this examination was performed safely (89.2%, $n = 82$), well-co-ordinated (88.8%, $n = 82$) and was executed fairly (61.3%, $n = 57$). However, 47.8% ($n = 44$) of students reported that wearing a face-mask impacted on their ability

to communicate effectively with patients (simulated patients) during the OSCE.

Questionnaire: Free-Text data

In total, five themes emerged relating to the 2020 OSCE: (1) timing of the OSCE negatively impacted student well-being ($n = 13$), (2) deleterious impact of mandated COVID-19 restrictions on OSCE performance ($n = 8$), (3) student preference for more OSCE stations ($n = 6$), (4) student preference for live rather than virtual OSCE ($n = 5$), and (5) the modified OSCE was a positive experience ($n = 11$) (see Table 4).

Discussion

This study demonstrated that despite challenges encountered by the COVID-19 pandemic, conducting modified face-to-face OSCEs are feasible. Students attained a marginally higher overall grade (3%) with the modified 2020 ACS OSCE, with no difference in the number of failing students. Overall student feedback was positive regarding both the co-ordination of the modified-OSCE and their own safety in undertaking the modified-OSCE; however, almost half of the students reported that wearing a face-mask impeded their ability to communicate with the standardised patients during the examination.

The overall mean total assessment result and three of the discipline mean results (Psychiatry, General Practice and Obstetric and Gynaecology) demonstrated statistically higher marks in the modified face-to-face OSCE in 2020 when compared to results obtained in 2019. There are a number of potential reasons which may attribute to this difference. Firstly, students had a longer time-frame to prepare for this assessment (as this examination was postponed from until August), with additional teaching sessions conducted throughout the summer. Secondly, a reduction in the assessment time and stations being assessed by each discipline, was associated with a reduced assessment blueprint. This resulted in all core features being assessed (i.e. risk, communication), but some clinical knowledge being assessed in less detail than with previous examinations (i.e. therapeutics), potentially making some components of the modified OSCE easier for some students (Hijazi & Downing 2008; Khan *et al.* 2013). Our findings are consistent with robust evidence to support the use of reduced assessment in sequential OSCE formats in order to progress competent students (Cookson *et al.* 2011; Pell *et al.* 2013). It was notable that this modified OSCE had a similar overall pass rate compared to the 2019 OSCE. It is possible that this modified OSCE may have been less sensitive in distinguishing between different grades. However, the metrics of quality of the examination, for example, Cronbach Alpha were noted to be similar between 2019 and 2020.

Quantitative data noted high levels of student satisfaction, however, students expressed concern regarding the possible impairment in communication secondary to wearing a face-mask. Statistical analysis further demonstrated that there was only a very minimal difference in the mean score yielded for communication skills in 2019 vs. 2020. Additionally, the wearing of face-masks replicates current clinical practice for all students; but this was less familiar in August 2020, and would have been the first examination this cohort of students would have undertaken whilst wearing a face-mask. Consequently, we plan to further investigate this concern in the 2021 exam which will again require all students to maintain social distance and wear face-masks. An additional concern notable from qualitative comments related to the timing of the modified OSCE, which was perceived as unfair by some students,

Table 2. Examination blueprint with learning outcomes

Learning outcomes	Cases should come from student guide to cases of importance				
		PAEDIATRICS	OBGYN	GP	PSYCHIATRY
On successful completion of the module the learner will be able to:	Domain				
1 Take a history from people of relevant specialities, across a wide range of different scenarios, showing a patient-centred, sensitive, multicultural, structured and thorough approach with demonstration of principles of good communication.	History taking	x		x	x
2 Undertake a physical examination/mental state examination that are systems-based; appropriate for patient's age, gender and state of mental and physical health, in a rigorous, sensitive, efficient and systematic manner.	Clinical examination		x	x	
3 Demonstrate awareness of accepted professional attitude and behaviour with patients, carers and colleagues	Communication	x	x	x	x
4 Demonstrate awareness of patient safety in the specialist areas of Child Health, Women's Health, Community and Mental Health	Safe practice		x	x	
5 Evaluate and analyse common investigative test results, and interpret any positive or negative findings therein, and exhibit a further ability to request further appropriate investigations, in the speciality subjects	Data interpretation	x		x	
6 Synthesise competently, in the specialist clinical context, all available information gathered from history, examinations and basic investigate testing and formulate a reasonable working diagnosis and differential diagnosis, whilst recognising life threatening conditions that require immediate treatment.	Diagnosis		x	x	
7 Explain effectively the diagnosis/prognosis and agree a management plan with the patient or team member, including reference to appropriate additional sources of expertise and information.	Management		x	x	x

Communication: h = History taking; Ex = Examination; ep = Effective explanation; GP = General practice; OBGYN = Obstetrics and Gynaecology.

Table 3. Comparison of ACS marks between 2019 and 2020 OSCEs

	2019 Mean (SD)	2020 Mean (SD)	Statistics <i>t, p</i>
General practice	61.65 (6.91)	69.03 (10.02)	8.549, <0.001
Obstetrics and Gynaecology	56.35 (6.60)	59.13 (8.99)	3.397, 0.001
Paediatrics	61.76 (8.15)	62.44 (9.95)	0.748, 0.455
Psychiatry	57.69 (6.08)	61.22 (7.40)	5.207, 0.001
Total ACS mark	59.35 (5.54)	62.95 (6.21)	6.092, <0.001
Cronbach alpha	0.777	0.796	
	<i>n</i> (%)	<i>n</i> (%)	χ^2, p
ACS grade			27.257, < 0.001
H1	2 (1.00)	23 (11.50)	
H2	97 (48.50)	113 (56.50)	
Pass	93 (46.50)	58 (29.50)	
Fail	8 (4.00)	9 (4.50)	

occurring just prior to commencement of their final medical year, disrupting students' ability to have "time-off" studying prior to commencement of a busy academic year. As stated above, this may have paradoxically led to the attainment of higher scores on this examination, given the additional study time available. The timing of the OSCE was however organised in August 2020 for a number of reasons including: (i) COVID-19 rates had reduced significantly, (ii) attainment of the ACS was mandatory prior to commencement

of 5 MB (final year of medicine), and (iii) allowed students sufficient time to organise travel from various international jurisdictions and engage in quarantine prior to sitting the OSCE (see Table 1). We plan to compare 5 MB clinical and non-clinical results between 2021 and both 2019 and 2020 to ascertain any potential impact of fatigue on examination performance, relating to this point. It is also possible that student experienced significant anxiety symptoms pertaining to the COVID-19

Table 4. 2020 OSCE: student feedback

	Strongly agree n (%)	Agree n (%)	Neutral n (%)	Disagree n (%)	Strongly disagree n (%)
Q1. I felt safe during the examination	60 (65.5)	22 (23.7)	6 (6.5)	2 (2.2)	2 (2.2)
Q2. I felt the OSCE was executed fairly	29 (31.2)	28 (30.1)	13 (15.1)	15 (16.1)	7 (7.5)
Q3. I felt the exam was well co-ordinated	48 (52.2)	34 (36.6)	6 (6.5)	3 (3.3)	1 (1.1)
Q4. Communication received prior to exam was clear and effective	28 (30.1)	6 (30.3)	16 (17.2)	16 (17.2)	3 (3.2)
Q5. Spidergram Feedback received after the exam was useful and effective	18 (19.6)	21 (22.8)	18 (19.6)	25 (27.2)	10 (10.9)
Q6. Do you feel the learning outcomes were clearly outlined and easily understood?	13 (14.1)	44 (47.8)	10 (10.9)	20 (21.7)	5 (5.4)
Q7. Wearing a face-mask affected my ability to communicate with patients during the OSCE	15 (16.3)	29 (31.5)	16 (17.4)	26 (28.3)	6 (6.5)

Total number of respondents = 93 (%).

Table 5. Themes emanating from free-text responses: students comments regarding their experience of the modified OSCE during the COVID-19 pandemic

<p>Theme 1: Timing of OSCE negatively impacted well-being (n = 13)</p> <ul style="list-style-type: none"> • “The timing of the exam was terrible, it stressed me and many of classmates out and robbed us of any real break between the two most stressful years of our course.” (#14) • “The OSCE exam was not scheduled well as it was done at the end August . . . It was an unnecessary wait and caused unnecessary stress during the summer/COVID-19 holiday.” (#31)
<p>Theme 2: Deleterious impact of mandated restrictions on OSCE performance (n = 8)</p> <ul style="list-style-type: none"> • “Wearing of the face mask definitely interferes with communication and non-verbal body language”. (#6) • I found it extremely difficult to communicate effectively with both the patient and the examiner(s) while wearing a mask”. (#29)
<p>Theme 3: Preference for more OSCE stations (n = 6)</p> <ul style="list-style-type: none"> • “I think one station per subject area does not give a clear picture of a candidate’s ability”. (#3) • “In my opinion, it is much better to have less stations . . . however I think at least 2 stations per discipline would be fairer.” (#44)
<p>Theme 4: Preference for live rather than virtual OSCE (n = 5),</p> <ul style="list-style-type: none"> • “I would much prefer to do OSCE’s on site rather than via Zoom! It’s much more engaging (#12) • “The idea of online OSCE seems awkward, especially when the main focus is communication skills.” (#26)
<p>Theme 5: Modified OSCE was a positive experience (n = 11)</p> <ul style="list-style-type: none"> • “The School of Medicine did a wonderful job in terms of adjusting to the COVID-19 circumstances.” (#2) • “The School did a great job at creating a supportive environment despite the new changes, even offering water during the OSCE (particularly useful because of the wearing of the face mask)” (#38)

pandemic and its mandated social restrictions and consequences thereof, which might have attributed to some students’ negative perceptions’ of the examination process (Chandratre 2020).

It was clear from student feedback and examination scores that conducting this modified OSCE was feasible during the COVID-19 pandemic, albeit significant organisation was required. This is consistent with findings from face-to-face OSCEs conducted in other international institutions, which similarly point to the the importance of re-structuring circuits and amending OSCE venues to create the appropriate environment for this assessment (Darling-Pomranz *et al.*, 2020; Boursicot *et al.* 2020). Of note, we are unaware of any student, administrator or examiner contracting COVID-19 secondary to undertaking the ACS OSCE.

This study is associated with a number of limitations. Firstly, no formal feedback was attained from the administrative staff and examiners involved in this preparation, organisation and marking of this examination. Secondly, other modified OSCE options (an examination of eight stations for example) might have led to alternate results, potentially more similar to those noted in 2019, and

consequently we plan to undertake an eight station ACS OSCE in May 2021, and will compare results with both the 2020 and 2019 examinations. Such an examination will also potentially address the important confounder of the timing of the OSCE in August 2020, which allowed additional time for studying and preparation and may potentially have inflated mean scores.

Conclusion

This study has demonstrated the feasibility of conducting an OSCE examining disciplines including psychiatry during the COVID-19 pandemic and demonstrated only marginal differences in results attained. Additionally, student feedback was predominantly positive in relation to the co-ordination of the modified-OSCE and their own safety in undertaking the exam, albeit some concern was noted in how wearing face-masks might impact communication with simulated patients.

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Conflict of interest. Authors have no conflicts of interest to disclose.

Ethical standards. Ethical approval was attained from the Galway University Hospitals Research Ethics Committee (C.A. 2351; granted December 17th, 2020). The authors assert that all procedures contributing to this work comply with the ethical standards of the relevant national and institutional committee on human experimentation with the Helsinki Declaration of 1975, as revised in 2008.

References

- Boursicot K, Kemp S, Ong T, Wijaya L, Goh S, Freeman K, Curran I** (2020). Conducting a high-stakes OSCE in a COVID-19 environment. *Medical Education Publish* **9**, 1 DOI [10.15694/mep.2020.000054.1](https://doi.org/10.15694/mep.2020.000054.1).
- Chandratre S** (2020). Medical students and COVID-19: challenges and supportive strategies. *Journal of Medical Education and Curricular Development* **7**, 2382120520935059.
- Cookson J, Fagan G, Mohsen A, McKendree J, Mohsen A** (2011). A final clinical examination using a sequential design to improve cost-effectiveness. *Medical Education* **45**, 741–747.
- Council IM** (2012,A). *Foundation for the Future: guidelines for medical schools and medical students on undergraduate professionalism*. Irish Medical Council: Dublin.
- Darling-Pomranz C, Gray J, Watson C** (2020). Undertaking a face to face summative OSCE assessment during the COVID-19 pandemic - a descriptive narrative. *Medical Education Publish* **9**, 244 DOI [10.15694/mep.2020.000244.1](https://doi.org/10.15694/mep.2020.000244.1).
- Gormley G** (2011). Summative OSCEs in undergraduate medical education. *Ulster Medical Journal* **80**, 127–132.
- Hijazi M, Downing SM** (2008). Objective structured clinical examinations as an assessment method in residency training: practical considerations. *Annals of Saudi Medicine* **28**, 192–199.
- Kakadia E, Chen E, Ohyana H** (2020). Implementing an online OSCE during the COVID-19 pandemic. *Journal of Dental Education* **85** **S1**, 1006–1008 DOI [10.1002/jdd.12323](https://doi.org/10.1002/jdd.12323).
- Khan KZ, Gaunt K, Ramachandran S, Pushkar P** (2013). The Objective Structured Clinical Examination (OSCE): AMEE Guide No. 81. Part I: an historical and theoretical perspective. *Medical Teacher* **35**, e1437–e1446.
- Lara S, Foster CW, Hawks M, Montgomery M** (2020). Remote assessment of clinical skills during COVID-19: a virtual, high-stakes, summative pediatric objective structured clinical examination. *Academic Paediatrics* **20**, 760–761.
- Newble D** (2004). Techniques for measuring clinical competence: objective structured clinical examinations. *Medical Education* **38**, 199–203.
- Pell G, Fuller R, Homer M, Roberts T** (2013). Advancing the objective structured clinical examination: sequential testing in theory and practice. *Medical Education* **47**, 569–577.
- Woolliscroft JO** (2020). Innovation in response to the COVID-19 pandemic crisis. *Academic Medicine* **95**, 1140–1142.
- World Health Organization**. (2021). Coronavirus disease (COVID-19) – Who.int, Available from: <https://www.who.int/emergencies/diseases/novel-coronavirus-2019>, (Accessed 9 Jan. 2021).
- Zayyan M** (2011). Objective structured clinical examination: the assessment of choice. *Oman Medical Journal* **26**, 219–222.

Appendix 1: Student Feedback Questionnaire



NUI Galway
OÉ Gaillimh

Student Experience during the Covid-19 crisis

Please complete this survey to give us an understanding of your experience regarding the undertaking of examinations during the Covid-19 crisis. Your comments are appreciated.

1. I felt safe coming on-site to the University and felt that appropriate Covid-19 safety measures were in place

Strongly Agree
Agree
Neutral
Disagree
Strongly disagree
2. I felt that examinations that I undertook were executed fairly

Strongly Agree
Agree
Neutral
Disagree
Strongly disagree
3. Communications received prior to the exam were clear and effective

Strongly Agree
Agree
Neutral
Disagree
Strongly disagree
4. Spidergram Feedback received after the exam was useful and informative

Strongly Agree
Agree
Neutral
Disagree
Strongly disagree
5. Do you feel the exam was well coordinated and ran smoothly on the day

Strongly Agree
Agree
Neutral
Disagree
Strongly Disagree
6. Did you feel that learning outcomes were clearly defined and easily understood

Strongly Agree
Agree
Neutral
Disagree
Strongly disagree
7. I felt the wearing of a face mask affected my ability to communicate with the Patients

Strongly Agree
Agree
Neutral
Disagree
Strongly disagree
8. Please add any additional comments/feedback here

Enter your answer