Online Test Application during COVID-19 Pandemic: Academic Impact on Medical Students of the biggest School of Medicine in Mexico

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Abstract

Introduction: Online assessment is an educational alternative in this health emergency generated by COVID-19. To meet the educational demands of the School of Medicine of the UNAM, we implemented the evaluation of their subjects of the Medical Bachelor online, avoiding the delay of the school career of their students.

Methods: A quantitative analysis was conducted to evaluate the academic performance of students enrolled in the first and second year of the degree of Medical Bachelor, being the school years with the highest percentage of failure. Two cohorts of students (2019 vs 2020) in the first and second year of the degree (4,737 students) were analyzed. We compared their school performance in the exams taken in those years (2019 on School premises and 2020 online due to the COVID-19 pandemic) to observe if there was a significant difference through statistical tests according to the distribution of the cohorts.

Results: A significant difference was obtained in subjects of both school years according to their school performance. Besides, the percentage of the passing of the 16 subjects in their two evaluations was evaluated, observing that the students of the year 2020 had a higher rate of passing compared to the year 2019, even in those subjects with a higher percentage of failing.

Discussion: Our study allowed us to compare the academic performance of our students in two types of examinations, in the School of Medicine and online (because of COVID-19), a situation that will enable us to assess the advantages of this adaptation and a new form of evaluation as a result of the health emergency.
Keywords: School development; Active learning; Medicine; Change; Online evaluation; COVID-19

Introduction

Recently, humankind has experienced one of the most critical pandemics in contemporary history. Since its first notification, at the end of 2019 in Wuhan (China), the coronavirus disease (COVID-19) caused a borderless health emergency, which evidenced the existence of endless economic, financial, social, and educational deficiencies worldwide.

It was not until the end of February 2020 that the first case of COVID-19 was reported in Mexico City, which led to the creation of health and distance measures in the country’s productive, business, and educational sectors. Thus, as of the third week of March 2020, the National Autonomous University of Mexico (UNAM) suspended all its academic and administrative activities in all its campuses (Fernandez et al., 2020); this led to the search for educational strategies with distance modalities that would guarantee the exercise of teaching-learning in an organized and systematic way for its 360,883 students enrolled in the period 2019-2020 (UNAM, 2020).

The UNAM School of Medicine, since it is in the season of annual academic closure, developed actions aimed at continuing with the provision of education and educational evaluation in the face of this pandemic. Like many other medical education institutions, the School of Medicine sought to ensure that this temporary interruption of its activities would have minimal repercussions on the school career of each of its students; however, the duration and impact of this new pandemic is unknown.

The assessment of students during the COVID-19 pandemic has been an international challenge (Hall et al., 2020), leading to a change even in the methods of implementation of the tests. It should be noted that school evaluation through examinations has represented one of the most complete tools, in which the teacher can assess the preparation of the student, having a significant impact on teaching and learning (Al-Qdah and Ababneh, 2017), under this principle, distance evaluations would have to meet this objective. However, this modality still has disadvantages and seems not to have conclusive studies that evaluate the matching of evaluation techniques and analysis of learning processes and academic performance (Kühbeck et al., 2019).

Imperial College London is an example of an institution that adopted an online examination approach in this pandemic, to ensure the educational development of its sixth-year medical students (Tapper, Batty and Savage, 2020), with the dilemma that the application of exams from home does not have the necessary conditions for a quiet application environment for students, compared to what has been the norm in the institutions.

Other universities have introduced open book exams, and although it is a sudden change, it has been shown that this examination modality reduces student anxiety, being an area of opportunity during the health emergency, minimizing stress symptoms for some students (Sandhu and De Wolf, 2020).

The Yong Loo Li School of Medicine also implemented the online exams with three modalities in which social distancing was the objective that regulated the evaluation aspects. The first two actions were aimed at the application of remote, digital and teleconference exams; the third action consisted in exams involving the student, patient, and evaluator where the use of simulators was chosen to minimize contact; in cases where the presence of a patient was necessary, the evaluators were trained in the appropriate use of personal protective equipment to reduce and control health risks (Ashokka et al., 2020).

Although this modality provides notable advantages such as the accessibility of evaluating different places and at
different times, greater randomization of reagents, instantaneous scores and the possibility of continuous feedback, it also has several areas of opportunity such as the inevitable need for personal computer equipment for students, and efficient navigation network for the interrupted performance of the evaluations as well as the search for a controlled environment that prevents the student from searching for the answer on the web, or communicating with a third party to obtain answers (Gehringer and Peddycord, 2013).

Although educational institutions were forced to transform their teaching and assessment methods at a fast pace due to the pandemic, we cannot fail to highlight the emerging and essential challenge of innovation in the educational field that the health emergency highlighted.

Acknowledging this process’ importance, we conducted a quantitative study to estimate the statistical difference between the face-to-face assessments in 2019 and the assessments conducted online in 2020 in response to the health emergency by COVID-19, of students enrolled in the first and second year of the UNAM School of Medicine.

**Methods**

**Our medical curriculum structure**

In the School of Medicine of the UNAM, to complete the Medical Bachelor (MB), students must complete 4 phases of academic training under their 2010 Plan of Studies (UNAM, School of Medicine, 2009):

- **Phase one**: organized in two years, consisting of 16 subjects, where the student is required to acquire theoretical biomedical and sociomedical knowledge.
- **Phase two**: organized in five semesters, made up of 38 subjects where students will acquire the skills, abilities, attitudes, and aptitudes necessary for the practice of general medicine in real environments.
- **Phase three**: corresponding to the undergraduate medical internship, distributed in 6 clinical rotations, practice phase, and incorporation to the health care team of the health care institutions.
- **Phase four**: corresponding to the social service year, where the student provides comprehensive care as a complementary social clinical activity.

**Phase one - Academic status**

According to the 2010 Plan of Studies, medical students during phase one take fourteen annual and two-semester courses (Biomedical Informatics I and II) within the facilities of the School of Medicine in a theoretical-practical manner. According to a 2010 study plan's monitoring of student trajectory, we observed that in this phase of knowledge the subjects with a high rate of failure are found, highlighting Anatomy, Biochemistry and Molecular Biology, Cell Biology and Medical Histology and Human Embryology in the first year; while in the second year we observe Physiology and Immunology (Fernandez et al., 2018).

Because of the high failure rate in the subjects mentioned above (40% in the first year and 27% in the second year during the 2010-2015 school year), it is crucial to monitor them to evaluate the curriculum. However, with the pandemic conflict caused by COVID-19, the form of evaluation of the final assessment exams of the 16 subjects in phase one was readjusted.

Before the pandemic, these subjects were evaluated employing an online exam in computers at the School of Medicine, monitored by professors at university facilities, distributed at different times of the day according to the quota of the facilities and the number of applicants per subject; however, after the closure of the university facilities due to the social distancing carried out in March 2020 by COVID-19, the application of these exams were carried out from the home of each of the students.
Phase one - Online evaluation

With the support of each of the academic departments responsible for the 16 subjects in this theoretical phase, it was agreed to hold the exams on the dates established by the 2019-2020 school calendar, through the online and distance modality. The exams would have to be applied in half the usual time (around one hour); they would be made up of 40 to 60 multiple choice reagents, of an explanatory nature, including clinical scenarios and reducing the contents of memory.

Two examinations per subject known as first and second ordinary exams were carried out to accredit them with a score equal to or higher than six to continue with their school career through the MB.

Knowledge evaluation - Outcome

Academic performance in the two school years was evaluated with the score obtained through the application of the exams according to the school year. In the case of 2019, it was through monitoring by the Faculty in person at its facilities, through a computer system where it is prevented from opening other web pages and having interaction during the exam; while in 2020, after the social distancing, students were asked to enter a link where it was verified that no two users registered with the same account, the movements of the exam system were monitored and recorded. As an aid to students, a communication channel (Telegram) was implemented to address technical issues relevant to the exam.

Results/Analysis

A total of 4,737 MB students were included: 2,864 freshmen (1,518 in 2019 and 1,346 in 2020); as well as 1,873 sophomores (935 in 2019 and 938 in 2020). The majority of the population studied was between the ages of 18 and 21, with a predominance of females (68%).

Evaluation of school performance

Because the student population that took regular exams was different in each subject and school year, Table 1 shows the number of candidates who took the exams in the first and second year of the degree.

Table 1: Students who took ordinary examinations in Medicine Bachelor's phase one

| SCHOOL YEAR | FIRST YEAR'S SUBJECTS | SECOND YEAR'S SUBJECTS |
|-------------|-----------------------|------------------------|
|             | ANATOMY               | HISTOLOGY AND CELL BIOLOGY | BIOCHEMISTRY AND MOLECULAR BIOLOGY | HUMAN EMBRYOLOGY | BASIC CLINICAL INTEGRATION I | INTRODUCTION TO MENTAL HEALTH | PUBLIC HEALTH AND COMMUNITY | BIOMEDICAL INFORMATICS I |
|             |                       |                        |                                  |                   |                           |                              |                           |                           |
| FIRST ORDINARY | 1,095 | 627 | 948 | 988 | 370 | 62 | 68 | 691 |
| 2019 | 529 | 604 | 952 | 929 | 47 | 35 | 529 | 83 |
| 2020 | 770 | 327 | 676 | 526 | 95 | 20 | 9 | 275 |
| SECOND ORDINARY | 287 | 282 | 43 | 11 | 18 | 221 | 12 | 157 |
| 2019 | 175 | 473 | 13 | 37 | 66 | 284 | 396 | 367 |
| 2020 | 31 | 329 | 17 | 10 | 2 | 106 | 45 | 83 |

To verify whether there was a significant difference between the 2019 and 2020 school year grades in phase one of the MB, we obtained the statistical normality distribution of grades.
According to the distribution, two statistical tests were performed, with Mann Whitney’s U being used for the population that did not have a normal distribution (most subjects). While in the case of Introduction to Mental Health and Biomedical Informatics II, the Student T-test was applied with two independent samples since they had a normal distribution (Table 2).

Table 2: Asymptotic significance according to Mann Whitney's U Test and Student T-test

| SCHOOL YEAR | FIRST YEAR'S SUBJECTS | ANATOMY | HISTOLOGY AND CELL BIOLOGY | BIOCHEMISTRY AND MOLECULAR BIOLOGY | HUMAN EMBRYOLOGY | BASIC CLINICAL INTEGRATION I | INTRODUCTION TO MENTAL HEALTH | PUBLIC HEALTH AND COMMUNITY | BIOMEDICAL INFORMATICS I |
|-------------|-----------------------|---------|---------------------------|-----------------------------------|-----------------|-----------------------------|------------------------------|---------------------------|-------------------------|
| FIRST ORDINARY |                       | .000    | .000                      | .000                              | .000            | .036                        | .04                          | .000                      | .000                    |
| 2019        |                       | .000    | .000                      | .000                              | .000            | .179                        | .00                          | .000                      | .000                    |
| 2020        |                       | .000    | .000                      | .000                              | .000            | .000                        | .00                          | .000                      | .000                    |
| SECOND ORDINARY |                  | .002    | .002                      | .002                              | .052            | .699                        | .002                         | .002                      | .000                    |
| 2019        |                       | .000    | .000                      | .000                              | .000            | .000                        | .000                         | .000                      | .000                    |
| 2020        |                       | .000    | .000                      | .000                              | .000            | .000                        | .000                         | .000                      | .000                    |

When assessing academic performance between the 2019 and 2020 school years, it was observed that the subjects that performed similarly in the first year were:

- First grade: Anatomy, Cell Biology, and Medical Histology and Biomedical Informatics.
- Second grade: Basic Clinical Integration I and Public Health and Community

In contrast, in the second-year group, a similar behavior was observed in:

- First ordinary: Introduction to Surgery, Health Promotion in the Life Cycle, and Immunology.
- Second ordinary: Microbiology and Parasitology, Basic Clinical Integration II, Introduction to Surgery, and Immunology.

The rest of the subjects have a significant difference in school performance in these school years.

Percentage of approval of phase one

Table 3 shows the percentage of approval in each of the evaluations carried out in the first and second year of the MB during 2019 and 2020, observing a notable increase in the percentage of approval in 2020 referring to 2019 in almost all subjects. Overall, there was an increase in total approval in 2020 by nearly 9% for the first year and 1% for the second year compared to 2019.

Table 3: Approval rate in phase one subjects in the school years 2019 and 2020

| SCHOOL YEAR | FIRST YEAR'S SUBJECTS | ANATOMY | HISTOLOGY AND CELL BIOLOGY | BIOCHEMISTRY AND MOLECULAR BIOLOGY | HUMAN EMBRYOLOGY | BASIC CLINICAL INTEGRATION I | INTRODUCTION TO MENTAL HEALTH | PUBLIC HEALTH AND COMMUNITY | BIOMEDICAL INFORMATICS I |
|-------------|-----------------------|---------|---------------------------|-----------------------------------|-----------------|-----------------------------|------------------------------|---------------------------|-------------------------|
| FIRST ORDINARY |                      | 27.21%  | 40.98%                    | 19.40%                            | 43.72%          | 72.97%                      | 39.67%                       | 86.76%                    | 61.07%                  |
| 2019        |                       | 27.21%  | 40.98%                    | 19.40%                            | 43.72%          | 72.97%                      | 39.67%                       | 86.76%                    | 61.07%                  |
| 2020        |                       | 27.21%  | 40.98%                    | 19.40%                            | 43.72%          | 72.97%                      | 39.67%                       | 86.76%                    | 61.07%                  |
Discussion

This study compared school performance and pass rates of regular examinations in phase one of the 2010 MB curriculum in the 2019 and 2020 school years. It was observed that, following the restructuring of assessment methods in the face of the pandemic by COVID-19, there was an 8.89% increase in student pass rates in 2020 in the first year, while in the second year it was 1.21%; it should be noted that each country has implemented educational tools in response to its possibilities and needs for this type of modality used by the health emergency (Herrera and Toro, 2020).

According to UNESCO data, many countries including Angola, India, Indonesia, Malta, Mexico, Micronesia, Mongolia, Morocco, Palau, Thailand, Tonga, and Venezuela decided to introduce alternative approaches in specific contexts for testing and validating learning by reducing the number of tests, modifying the test format and assessing the student's learning portfolio without considering test results (Gwang et al., 2020).

The adaptation of the School of Medicine, as well as other universities to this global crisis (Watson et al., 2020; João and Carvalho, 2020), allowed technological innovation and the provision of distance education to become indispensable educational elements to continue the training process of thousands of students.

Online evaluation, therefore, requires a redesign of the evaluation system of the subjects in the current curriculum, allowing the establishment of methodological and technological competencies, to know the functionalities and limitations of the computer tools, but being aware that technology is a simple facilitator of evaluation (Garcia et al., 2020); therefore, after this transition to online and distance formats, a post-evaluation is required (Rose, 2020).

In our case, because of the pandemic, this "emergency" online evaluation resulted in a lesser degree of failure for our students. This has been an initial quantitative approach that deserves to be complemented by other studies to be followed. Possible initial explanations could be better performance of students in remote evaluations, an unusual response due to the pandemic conditions, not allowed collaborative work among students, or exams with less knowledge to explore (due to the sudden end of courses).

For better performance of students at home we do not have yet a plausible explanation since the time considered for online evaluations hardly would have let them access to consult information during the exam (cheating) or could be secondary to lesser stress at home when answering exams. An unusual response during this pandemic could be for students to focus on their exams as a form to avoid the devastating reality due to the health situation.

More evidence should be analyzed, and qualitative studies should be performed to better explain and characterize this situation.
Conclusion

The educational intervention of the School of Medicine of the UNAM, as well as of several universities in the face of this health emergency, represented an organizational challenge.

Nevertheless, the educational evaluation was carried out within the established time frame to avoid a delay in the students' school career. According to our study, there was more approval in the subjects that generally have a higher percentage of failure. However, it is necessary to complement this study with a qualitative analysis evaluating those variables that led to this situation.

The online evaluation is a handy tool that has been implemented in several educational institutions worldwide; this has allowed us to visualize several areas of opportunity that educational entities should consider, and not only use it as a tool of immediate need in the face of health emergencies.

Medical schools face an enormous challenge at the organizational and institutional level, which will undoubtedly leave significant learning good enough to undertake successful actions at the educational level.

**Take Home Messages**

- The educational processes have to continue despite the health emergency, so the UNAM School of Medicine sought to adapt in the best possible way to this situation, implementing the final evaluation of phase 1 with online examinations of an explanatory nature and special features, such as clinical scenarios and the reduction of memory content.
- The student population of the degree in Medicine, despite the contingency of the COVID-19, had a higher percentage of approval in subjects that generally have the characteristic of having a high rate of non-approval, showing a statistically significant difference in most of their subjects in comparison with the 2019 school year.

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Bibliography/References

Al-Qdah, M. and Ababneh, I. (2017) 'Comparing Online and Paper Exams: Performances and Perceptions of Saudi Students', International Journal of Information and Education Technology, 7 (12), pp. 106-109. https://doi.org/10.18178/ijiet.2017.7.2.850

Ashokka B., Ong S. Y., Tay K. H., Loh, N. H. W., et al. (2020) 'Coordinated responses of academic medical centres to pandemics: Sustaining medical education during COVID-19', Medical Teacher, 42(7), pp. 762-771. https://doi.org/10.1080/0142159X.2020.1757634

Chol, G., Huong, L. T., Moumne, R., Bianchi, S., et al. (2020) 'COVID-19 Panorama of the strategies of response for the tests and evaluations of high impact or high impact', UNESCO. Available at: https://en.unesco.org/sites/default/files/unesco-covid-19-ed-webinar-4-working-document-es.pdf (Accessed: 20 August 2020).

Fernandez, M. A., Gutierrez, D., Ramirez, M., Cruz, P., et al. (2020) 'Experience of the biggest Med School in Mexico during the COVID-19 pandemic', MedEdPublish, pp. 1-12. https://doi.org/10.15694/mep.2020.000101.1

Fernandez, M. A., Gutierrez, D., Ramirez, M., Tellez, R., et al. (2018) 'The most difficult subjects at the biggest Med School in Mexico', School of Medicine UNAM. Available at: https://escolares.facmed.unam.mx/publicaciones/Poster_AMEE_2018_%20Basilea.pdf (Accessed: 20 August 2020).
Garcia, F. J., Corell, A., Abella, V. and Grande, M. (2020) 'Online Assessment in Higher Education in the Time of COVID-19', *Education in the Knowledge Society*, 21, pp.12.1-12.26. https://doi.org/10.14201/eks.23013

Gehringer, E. F. and Peddycord III, B. W. (2013) ‘Experience with online and open-web exams’, *Journal of Instructional Research*, 2, pp. 10-18. https://doi.org/10.9743/JIR.2013.2.12

Hall, A. K., Nousiainen, M. T., Campisi, P., Dagnone, J. D., *et al.* (2020) ‘Training disrupted: Practical tips for supporting competency-based medical education during the COVID-19 pandemic’, *Medical Teacher*, 42(7), pp.1-6. https://doi.org/10.1080/0142159X.2020.1766669

Herrera, P. and Toro C. J. (2020) 'Medical education during the COVID-19 pandemic: global initiatives for the undergraduate, internship, and medical residency', *Acta Med Peru*, 37(2), pp. 169-75. https://doi.org/10.35663/amp.2020.372.999

João. M. and Carvalho, M. (2020) 'A new era for medical education after COVID-19', *Journal of the Medical Education Foundation*, 23 (2), pp. 55-57. Available at: http://scielo.isciii.es/scielo.php?script=sci_arttext&pid=S2014-98322020000200001 (Accessed: 20 August 2020).

Kühbeck, F., Berberat P. O., Engelhardt, S. and Sarikas A. (2019) 'Correlation of online assessment parameters with summative exam performance in undergraduate medical education of pharmacology: a prospective cohort study', *BMC Medical Education*, 19(1), pp.412. https://doi.org/10.1186/s12909-019-1814-5

Rose, S. (2020) 'Medical Student Education in the Time of COVID-19', *JAMA Network*, 323 (21), pp. 2131-2132. https://doi.org/10.1001/jama.2020.5227

Sandhu, P. and De Wolf, M. (2020) 'The impact of COVID-19 on the undergraduate medical curriculum', *Medical Education Online*, 25, pp. 1. https://doi.org/10.1080/10872981.2020.1764740

Tapper, J., Batty, D. and Savage, M. (2020) 'Medical students take final exams online for first time, despite student concern', *The Guardian*. Available at: https://www.theguardian.com/education/2020/mar/22/coronavirus-forces-medical-students-sit-final-exams-online (Accessed: 20 August 2020).

UNAM. (2020) *University Statistics Portal*. Available at: http://www.estadistica.unam.mx/numeralia/ (Accessed: 20 August 2020).

UNAM, School of Medicine. (2009) *Curriculum 2010 and Academic Programs of the Bachelor of Medicine*. Available at: http://www.facmed.unam.mx/plan/PEFMUNAM.pdf (Accessed: 20 August 2020).

Walsh, K. (2015) 'Online assessment in medical education current trends and future directions', *Malawi Medical Journal*, 27 (2), pp. 71-72. https://doi.org/10.4314/mmj.v27i2.8

Watson, A., Mckinnon, T., Prior, S. D., Richards, L., *et al.* (2020) 'COVID-19: time for a bold new strategy for medical education', *Medical Education Online*, 25, pp. 1. https://doi.org/10.1080/10872981.2020.1764741
None.

**Declarations**

The author has declared that there are no conflicts of interest.

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**Ethics Statement**

This paper did not require Ethics Approval as there were no human or animal subjects involved in the research. No confidential subject's information was used or published. This paper describes academic impact based only on grades. Nevertheless, we have sent a letter of ethics exemption from our School of Medicine Ethics Review Board as required by the Editor.

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