

Undergraduate Research Training: E-learning Experience in Peru

Dear Editor,

Using information and communication technologies, students now can access all sorts of courses than previously only could be offered at universities through in-class lectures. The overall methodology developed for remote teaching using the Internet is known as e-learning.^[1] Although e-learning is relatively new in medical education, its increasing acceptance by students and teachers worldwide has caught the attention of most universities.^[2] However, its applications in research training have not been adequately studied.^[3]

In Peru, the Scientific Society of Medical Students (SOCIMEP) is one of the promoters of research among undergraduate students. Consequently, since 2012, SOCIMEP has organized several e-learning courses including courses on research methods and scientific writing. Some of these experiences have been previously reported in peer-reviewed journals.^[4,5]

We want to share the SOCIMEP latest experience promoting research using e-learning. Thus, we analyzed the curricula and outcomes in the three latest editions of the scientific writing and publication online course.

In 2015, the course was improved by implementing an easy to access online platform and by incorporating two signing

up modalities: “with manuscript” and “without manuscript.” Students trained in the with manuscript modality, in addition to the standard contents (as in the “without manuscript” mode), received the necessary one-to-one mentorship to complete and publish his/her research. We also implemented a theoretical-practical evaluation which included two comprehensive examinations (partial and final) and weekly assignments (with fully explained solutions) [Table 1]. These improvements allowed the SOCIMEP to achieve a higher coverage of the Peruvian medical student community as well as to improve the standard used at its different in-class training programs.

In summary, we have gained some experience in using e-learning for undergraduate research training, but we have a long way to go to master the method. Based on our experience, e-learning facilitates coverage of larger audiences with limited resources. However, further improvements are necessary to increase the completeness (completion of at least 70% of the course assignments and all the evaluations) and approval rates. Furthermore, we need to better evaluate the impact on “hard outcomes” such as the quantity and quality of undergraduate scientific production and to best verify the courses’ effectiveness. This evaluation has to standardize and should record the main students’ scientific outcomes in the

Table 1: Characteristics of the scientific writing and publication online courses of the Peruvian Scientific Society of Medical Students, 2012-2015

Characteristics	I. Online course of scientific writing of original articles	II. Online course of scientific writing and publication	III. Online course of scientific writing, publication and ethics
Year	2012	2014	2015
Mentorship staff	1*	5	7
Mentors with scientific production in Scopus, WoS, and/or Medline**	0	3	5
Modules/sessions/online lectures	9 sessions/18 online lectures	7 online lectures	2 modules/8 online lectures
Average length of videos (min)	12.4	28.4	30.4
Signing up modalities	Simple signing up	Simple signing up	Two modalities: basic (without manuscript) and with manuscript modality
Type of evaluation	Theoretical	Theoretical	Theoretical and practical
Minimum approval score	11	11	Overpassed=11 Approved=13
Students enrolled	302	345	225 (163 on basic modality and 62 on with manuscript modality)
Approved students	58 (19%)	283 (82%)	Basic modality=64 (39%) [†] With manuscript modality=3 (5%) ^{††}
Participation of students from other countries	Yes (4%)	Yes (5%)	Yes (4%)

*The course had online lectures from five different mentors. However, only one was an official course teacher. The remaining four already had online lectures available on the Internet, which were used in the course, **Mentors with at least two publications (article format) in a journal indexed in Scopus, WoS, and/or Medline, up to the year of the course, [†]Of the 64 students, 21 had a score of 13 or more, ^{††}Of the three students, only one had a score of 13 or more. WoS=Web of Science