Journal of Dental Sciences 17 (2022) 628–629

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A combination of virtual slides and online lecture learning in the oral pathology laboratory course is a suitable teaching mode during the COVID-19 pandemic

I read with interest the article by Chang et al.,[1] which the authors reported virtual microscopy has many advantages over real microscopy in oral pathology laboratory course teaching. I agree with the authors that virtual microscopy system may gradually replace the real microcopy for the learning of oral pathology laboratory course. Moreover, this system may play an essential role in its online teaching during the COVID-19 pandemic. Here, I would like to share my 3 years of experience in a combination teaching mode, including virtual slides and online learning in an oral pathology laboratory course.

In response to the COVID-19, we have established several online learning or teaching modes at Chung Shan Medical University.[2] I developed a hybrid teaching mode that combined traditional lecture and flipped classroom on two topics (epithelial and cutaneous pathology) in the "Oral Pathology" course through the school's online platform since 2017.[3] The teaching materials at class, including lecture slides, self-made lecture notes, and additional resources, were uploaded on the website. In this way, students could preview and review at any time before and after the class. Although Chang et al. mentioned that virtual slides have many advantages over glass slides, the virtual microscopy technique and equipment are not readily available for schools. Therefore, I made a digitalized slide learning using photo slides that were taken from the glass slides. Besides, I made laboratory teaching slides that highlighted the key points and basic knowledge of the slides. For example, for the "verruciform xanthoma" slides, I highlighted the basic knowledge of "structure of the oral epithelium" and "types of the oral mucosa," and with the key points of "verrucous surface," parakeratin between crypts," "epithelial ridges with a uniform depth," "xanthoma cells," and "clinicopathological correlation", which referred to no. 3.9 on the website mentioned above.[3] Moreover, I made clear and high-resolution slide lecture videos for each slide and uploaded them on the website[3] since 2019. Students could use traditional optical microscopy and learn from the online teaching video simultaneously. I took a satisfaction survey for third-year dental students with this hybrid method (traditional, flipped, virtual, and lecture videos) in the lecture and laboratory course of oral pathology. They had experienced this teaching mode in my classroom for two years in 2019. Results showed that the satisfaction rate were 97%, 93%, and 100% for the lecture notes, the online teaching materials, and the overall course, respectively (Table 1). Besides, they all 100% agreed with the questions of "the teaching method

Table 1 Dental students' satisfaction to the hybrid teaching mode on "Oral Pathology" and its laboratory course.

Items	Grade of satisfaction (%)				
	Very satisfied	Satisfied	Neutral	Dissatisfied	Very dissatisfied
[a]Q1 The lecture notes	62	35	3	0	0
[a]Q2 The online teaching materials	52	41	6	1	0
[a]Q3 The overall course	55	45	0	0	0

[a] Response rate: 83% (66/80).

https://doi.org/10.1016/j.jds.2021.09.027

can motivate my learning", "preview via flipped classroom makes me understand the lectures more easily", and "flipped classroom can promote learning atmosphere".

The teaching mode has changed a lot during the COVID-19 pandemic in Taiwan. Nowadays, online learning has become mainstream during the pandemic. The advances in virtual microscope technology provide new insight into microscopic slide teaching. A combination of virtual slides and online lecture learning is well-accepted by the students and is a suitable teaching mode in the oral pathology laboratory course during the COVID-19 pandemic.

Declaration of competing interest

The author has no conflicts of interest relevant to this article.

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Received 12 September 2021
Final revision received 21 September 2021
Available online 29 September 2021