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## Correspondence

# Hybrid teaching mode including physical, online, and flipped classroom learning for dental education in Taiwan



With great interest, I read the article by Chang et al. reporting the learning effectiveness between the physical classroom and online class learning for dental education during the COVID-19 pandemic.<sup>1</sup> I agreed with the authors that the combination of the physical classroom and online courses is the future trend of dental education. I wanted to extend this combination learning concept to flipped classroom and shared my 4-year experience here.

The dental education pattern was changed significantly since the COVID-19 pandemic worsened in April 2021 in Taiwan. At Chung Shan Medical University, we had established electronic educational platforms, video conferencing networks, social media, and haptic virtual reality simulation learning courses in response to the COVID-19 pandemic.<sup>2</sup> Studies have shown that the flipped classroom, reversing lecture and homework elements of a class, is associated with more significant academic achievement than the lecture-based learning method for higher-level learning outcomes.<sup>3</sup> I opened a hybrid teaching method that included traditional lecture and flipped classroom on “Oral Embryology and Histology” (OEH),<sup>4</sup> “Oral Pathology” (OP),<sup>5</sup> and “Oral Diagnosis” (OD) via the online platform of the school since 2017, with two-year preparation from 2015 to 2017. OEH, OP, and OD are the 2-year, 3-year, and 5-year dental students’ courses, respectively. Because these three courses were highly correlated, from healthy to diseased tissues and from fundamental knowledge to clinical practice, integrating these lectures was helpful for a comprehensive understanding of disease progression. Therefore, I designed integrated lecture notes, the “ShareStart lecture notes”, incorporating higher-thinking questions with different levels to help the students being actively engaged in self-learning. Before attending the classroom, students studied ShareStart lecture notes and online pre-recorded or supplement videos at the online platform of the school by

themselves. At the beginning of the classroom, students took a 10 to 15 core question-test to verify their self-learning outcome. Then, a topic-oriented discussion was conducted in the classroom to guide active learning, thinking, and expressing to the students. Increased interaction between teachers and students could also be achieved through this procedure. With this hybrid teaching method (traditional lecture combined with flipped classroom), I surveyed the year-2019 third-year dental students who had experienced this method in my classroom for two years. Results showed that 70% (46/66) dental students favored the hybrid teaching method (Table 1).

The COVID-19 crisis has a global influence on dental education patterns. Nowadays, online learning has become the mainstream of learning during the COVID-19 pandemic. Developing a well-constructed hybrid teaching mode including physical, online, and flipped classroom learning for Taiwan’s dental education is necessary in the near future.

**Table 1** Dental students’ response to the teaching method on “Oral Pathology”.

Question: Which of the following teaching mode do you prefer in the classroom?	
Items	Number of responses <sup>a</sup> (%)
“ShareStart” flipped classroom	15 (23)
Traditional lecture	5 (7)
Combination of flipped and traditional	46 (70)
No comments	0 (0)
Total	66 (100)

<sup>a</sup> Response rate: 83% (66/80).

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