

A Comparison study on online and offline problem-based learning of clinical Eight-Year program students

Ming Ji¹, Ziqiang Luo^{1*}, Yangting Xu², Yang Han¹, Chaxiang Guan¹, Dandan Feng¹

1. Department of Physiology, School of Basic Medical Science, Central South University, China

2. Five-year Program of Anesthesiology undergraduate student, Xiangya School of Medicine, Central South University, China

Background: In order to avoid/reduce the risk of Covid-19 infection, the time for students to receive conventional face-to-face lectures or discussion in school has been shortened, but providing opportunities for innovative practices in online medical education. Online PBL is a approach for distance teaching. By compared the performance of students between using online and offline PBL teaching, this study provided references and suggestions for how to evaluate and improve the quality of online PBL implementation. **Method:** From September 2020 to January 2022, a total of 100 clinical students of Eight-Year program in 2018 Grade completed 7 times offline PBL and one time online PBL on clinical cases. At the end of the course, questionnaire surveys were conducted twice to assess how students perceived the online and offline PBL teaching model on a five-point Likert scale. The data were analyzed by paired rank sum test. **Results:** Two questionnaires from 91 students were valid. The results showed that there was no significant difference in students' learning interest for PBL between online and offline ($z = -3.600$, $P = 0.719$). More than half of the students (63.7%, 58 / 91) thought that the perception of learning was essentially the same either in online PBL or in offline PBL, and there was no significant difference in learning engagement before class (69.2% , 63 / 91). However, the performance of students in the classroom was significantly different. The students' concentration in offline PBL classroom was significantly higher than that of online PBL ($Z=-4.244$, $P < 0.001$). In addition, the communications including teacher-student interaction ($Z = -2.647$, $P = 0.008$) and student-student interaction in offline PBL class were both better than that in online PBL class ($Z=-3.111$, $P=0.002$). Moreover, the same student paid more attention on listening to peers' speeches in offline PBL class than in online PBL class ($Z = -3.416$, $P = 0.001$). The results also showed that not only the students' learning efficiency of offline PBL was higher than that of online PBL ($z = -2.704$, $P = 0.007$), but also the improvement in the ability to apply knowledge to solve clinical problems in offline PBL was superior to that in online PBL ($z = -2.140$, $P = 0.032$). **Conclusion:** Students' pre-class preparation can ensure the implementation of online and offline PBL teaching, but the performance and learning efficiency of students in the offline PBL were better than that in the online PBL.

Keywords: Problem-Based Learning, Clinical Eight-Year Students, Online learning