

Chapter 12

Investigation of Pre–Service Teachers' Views on the Impact of COVID–19 on Online a Flipped Learning Model–Based General Chemistry Laboratory

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ABSTRACT

The aim of this study is to determine the views of pre-service teachers on the online flipped learning based general chemistry laboratory course. 16 pre-service teachers studying in the first year of the department of biology teaching participated in this study, which is based on qualitative research method. In the 11-week study, pre-service teachers participated in a total of nine experiments online. The views of the pre-service teachers were determined with three open-ended questions prepared by the researchers. Content analysis was used to analyze the data. Findings revealed that opinions on the online flipped learning model for this course were divided into positive and negative themes. Although it was observed that pre-service teachers had positive views on subjects such as the time and space flexibility of the flipped

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learning model and conducting experiments online, it was also found that they had difficulties in the process of attending an applied course online, such as technical problems and not finding a suitable environment for attending the course.

INTRODUCTION

The COVID-19 pandemic, which has swept the world in a short period of time, has necessitated the immediate migration of all educational environments to online environments. This has made the sustainability of education at all levels difficult. Especially the urgent need to conduct practical courses online brought many problems. It was very difficult to reach students in institutions that did not have the necessary infrastructure for online education. The solutions found to avoid further interruptions in education have generally been to provide students with online materials and to reach students through video conferences.

The rapid transition to online education due to the pandemic and the disruptions caused by this situation caused online education to be perceived as a crisis management rather than a long-term teaching method (Tang et al., 2020). In addition, the concern that conducting practical courses, especially laboratory courses, online may not be effective compared to the traditional method has also come to the fore. Especially in the first period of the pandemic, instructors tried to overcome this problem by incorporating various pedagogical methods into learning environments in order to make laboratory courses that had to be conducted online effective (Anzovino et al., 2020; Elkhatat & Muhtaseb, 2021; Feng et al., 2022; Mojica & Upmacis, 2022; Öztürk & Deniz, 2023; Villanueva & Zimmermann, 2020).

Flipped learning model is one of the teaching methods preferred to increase efficiency during the pandemic period. There are studies showing that the flipped learning model can provide a solution to the difficulties encountered in the transition to online education (Divjak et al., 2022). The flipped learning model, which gained popularity in the pre-pandemic period, especially as an approach that encourages student-centered learning and meets the need to integrate technology into educational processes, was also included in learning processes during the pandemic. The flexible and hybrid learning structure of the flipped learning model has adapted to the flexible working approach brought by the COVID-19 pandemic.

Flipped Learning Model Based Laboratory Courses

Chemistry is a branch of science in which theoretical and practical knowledge is offered together (Brown et al., 2006), and applied courses are extremely important in understanding the abstract structure specific to chemistry. Laboratory implemen-

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