

Critical assessment of virtual teaching strategies associated with the COVID-19 pandemic in the chemical engineering area in the University of Valencia

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Abstract

Teaching during the academic years 2019/2020 and 2020/21 was developed totally or partially in the virtual environment due to the health situation associated with the COVID-19 pandemic., which resulted in an intensive search for efficient strategies and resources to promote meaningful learning. IDIQMA group of the UV executed the educational innovation project VirtualChEng whose objective was to identify the most efficient strategies for the virtual teaching-learning experience on Chemical Engineering area, characterized by activities of a diverse and complex nature.

Methodology. Two surveys were specifically designed to gather opinion of students and lecturers on the virtual teaching-learning process on the academic years 2019-2020 and 2020-2021. In the 2019-2020 survey, students were asked to rate in a Likert Scale about (i) the modes of fully virtual teaching (synchronous, synchronous followed by the recorded lecture in the e-platform, or asynchronous) regarding the usefulness, the convenientness, the lecturer-student interaction, and the organization of study/free time, (ii) the e-platforms (Blackboard collaborate, Microsoft Teams, Zoom, etc.), (iii) the e-resources (recorded slides, lecture notes, videos, etc.), (iv) the individual online tutorials, and (v) the virtual modes and e-platform for the assessment (continuous evaluation, examination in official date, etc.). The content of the 2020-2021 survey was very similar, but the questions were adapted to the different teaching-learning methodologies used (face-to-face, virtual teaching or hybrid teaching).

Results. A total of 89 responses from course 2019-2020 and 270 responses from course 2020-2021 were collected from students of 4 different degrees and 2 master's degrees. In addition, 30 lecturers from the Department of Chemical Engineering responded to the survey. The results analysis of the fully virtual teaching experienced during the second semester of 2019/2020 highlighted that synchronous lecture in the official schedule was so far the preferred option when the recorded lecture was shared in the e-platform afterwards. The major problem encountered during this period was the excessive workload and the lack of motivation. The analysis of the data from 2020-2021 showed that the teaching model preferred by both students and teaching staff corresponds to the total face-to-face model, compared to the virtual and hybrid model. Students rated in the second position the mode in which they can freely choose between attending lectures in person or online, from the perspective of usefulness, comfort, ease of organizing their time, and interaction with lectures. However, this last mode of teaching received a very low grade from the lecturers. For the fully virtual teaching, teaching staff choose synchronous lectures as the preferred methodology while students reaffirmed their preference with synchronous lectures recorded and shared afterwards. It is noticeable that results indicated that only few lecturers would share their recorded lectures. Among the different e-platforms, Microsoft Teams received the highest score. The e-resources preferred by the students were videos and documents with problem solving, slides with didactic explanations and lecture notes. Regarding the assessment in virtual mode, both students and lecturers agreed to positively assess the mode based on continuous evaluation and examination on the official date.

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