

Extract of the paper “Design and Application of Flipped Classroom Methodology in the Subject of Physical Geodesy”

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Abstract

The subject of ‘Physical geodesy’ covers high-level physical and mathematical concepts related to the terrestrial gravity field, geoid modelling, and vertical systems. Teaching these concepts in traditional lecture sessions is challenging, as it requires students to grasp abstract ideas. To address this issue, a teaching innovation experience was carried out, proposing the use of the flipped classroom methodology. This approach aims to enhance learning by replacing lecture sessions with interactive activities. In this case, eight flipped classroom activities are designed to replace twelve hours of lecture teaching. Additionally, students are assigned short questions and asked to present key theoretical contents to reinforce their analytical and synthesis skills. The effectiveness of the methodology is evaluated through a post-subject questionnaire. While the flipped classroom approach has proven beneficial for active learning, academic performance, and knowledge acquisition, some challenges and areas for improvement are identified. It was found time-consuming to complete all the assigned activities before face-to-face classes, impacting the students’ ability to consult all resources. Overall, the flipped classroom methodology developed for engineering in geomatics and topography shows potential for transfer to other subjects within the degree program, such as geometric geodesy and spatial geodesy, where abstract concepts are also present to a lesser extent.

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Flipped Classroom; Geomatics; Physical Geodesy; Engineering Education

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