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Innovative Digital Teaching Approaches for Geographic Information Systems

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Abstract

Digital instruction is increasingly central to Geographic Information Systems (GIS) education, shaping the development of essential spatial skills and professional competencies.

This study investigates how online GIS teaching supports technical skill acquisition and enhances students' engagement with spatial analysis. The research aims to identify effective digital pedagogical strategies, evaluate learning outcomes, and assess student perceptions of online GIS education.

The analysis draws data from an online GIS program launched in 2021, which has enrolled 190 students and recorded 6,726 webpage visits. Instruction is delivered through Zoom and https://www.instateacher.gr/, using digital materials and current GIS literature. QGIS and ArcGIS Pro serve as the main learning platforms, supporting interactive mapping tasks and the management of vector and raster datasets. Student evaluation is conducted through online questionnaires measuring satisfaction and skills development.

Findings indicate that early engagement with digital GIS tools strengthens technical competencies, improves access to up-to-date information, and fosters both hard and soft skills. Interactive activities enhance understanding of spatial patterns, environmental issues, digital topographical products, statistical analysis, and web maps.

Digital GIS education promotes accessibility, reduces costs, and supports continuous learning through direct communication and idea exchange. As tasks progress in complexity, students demonstrate improved critical evaluation of online sources and enhanced cartographic creativity, confirming digital instruction as an effective model for future GIS training.

Keywords: Lifelong Learning; Interactive Digital Teaching, Digital Topographical Products