Advancing Skills for Sustainable Futures in Higher Education

Fadime AKSOY[1], Mine AYDEMIR DEV[2], Nuran BAYRAM ARLI[3]
[1]Bandırma Onyedi Eylül University; ,
[2, 3] Bursa Uludag University, Turkey

Abstract

The purpose of this study is to examine the relationship between university students' data literacy levels and sustainability knowledge levels using cluster analysis, thereby revealing the role of analytical skills in sustainability education. In this context, students were clustered in terms of both data literacy and sustainability knowledge, and the overlap between these clusters was analyzed. In the first stage of the study, students were grouped based on their data literacy levels obtained in three sub-dimensions: Data Processing, Data Identification, and Ethical Data Reasoning. Two distinct clusters -representing low and high levels of data literacy- were identified using k-means clustering methods. Variance analysis results revealed statistically significant differences across all dimensions ($p < .001$). In the second stage, students were clustered based on their sustainability knowledge levels, and two separate groups were defined. Statistically significant differences were also found between these groups ($p < .001$). However, cluster comparisons revealed no statistically significant overlap between the data literacy and sustainability knowledge clusters. This finding reveals that a high level of sustainability knowledge does not always go hand in hand with high data literacy. These insights contribute to the discourse on educational innovation by emphasizing the integration of data literacy into sustainability curricula. By aligning analytical skill development with sustainability goals, this study offers a strategic approach to preparing students for real-world challenges. In doing so, it supports the formation of future professionals equipped to make data-informed, sustainable decisions an essential competency in today's dynamic management and economic environments.

Keywords: cluster analysis; data literacy; decision-making skills; sustainability knowledge; university students