

## **Impact of Network Coverage and Strength on Undergraduates' Distance Learning in Sri Lanka during COVID-19**

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The second wave of the COVID-19 pandemic has encouraged the establishment of a virtual learning system among the higher education institutions in Sri Lanka. As a result, the students who live all over the country have been required to commit to distance learning from their residence. However, this virtual learning process has created several concerns of participation such as poor internet connection, data cost, inaccessibility to devices, power failures etc. According to the previous studies, more than 75% of the undergraduates have faced network coverage and strength related issues rather than other participating difficulties. Therefore, this study aimed to examine the impact of network coverage and strength on undergraduates' distance learning by analysing the satisfaction of students on online learning vs. their network strength and performing a mapping analysis to detect the spatial unevenness of network coverage in Sri Lanka. To fulfil the above objectives, network coverage data was collected from secondary sources, and primary data was collected by using a virtual questionnaire survey from 254 undergraduates (74 males & 182 females) in 163 Divisional Secretary's Divisions considering their permanent residency and the availability of 2G, 3G, & 4G coverage. Data was analysed quantitatively with the support of Excel & ArcGIS data analysis tools. The mapping analysis reflected that out of the total area of Sri Lanka (excluding forest & inland water bodies), 1.6%, 15.5%, and 11.5% do not have 2G, 3G, and 4G coverage respectively. Moreover, the undergraduates who live in areas with 2G coverage were very dissatisfied about the distance learning compared to the students in 3G and 4G areas; the students' satisfactory levels in 2G, 3G and 4G areas were 21%, 44% and 60% respectively. Therefore, the results suggest that authorities have to minimise the spatial unevenness of network coverage to provide a better virtual learning experience to the undergraduates.

**Keywords:** Distance learning, Network coverage and strength, COVID-19, Undergraduates