The Effect of Excel on Undergraduate Students' Understanding of Statistics and the Normal Distribution

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Abstract : Nowadays, statistical literacy is no longer a necessary skill but an essential skill with broad applications across diverse fields, especially in operational decision areas such as business management, finance, and economics. As such, learning and deep understanding of statistical concepts are essential in the context of business studies. One of the crucial topics in statistical theory and its application is the normal distribution, often called a bell-shaped curve. To interpret data and conduct hypothesis tests, comprehending the properties of normal distribution (the mean and standard deviation) is essential for business students. This requires undergraduate students in the field of economics and business management to visualize and work with data following a normal distribution. Since technology is interconnected with education these days, it is important to teach statistics topics in the context of Python, R-studio, and Microsoft Excel to undergraduate students. This research endeavours to shed light on the effect of Excel-based instruction on learners' knowledge of statistics, specifically the central concept of normal distribution. As such, two groups of undergraduate students (from the Business Management program) were compared in this research study. One group underwent Excel-based instruction and another group relied only on traditional teaching methods. We analyzed experiential data and BBA participants' responses to statistic-related questions focusing on the normal distribution, including its key attributes, such as the mean and standard deviation. The results of our study indicate that exposing students to Excel-based learning supports learners in comprehending statistical concepts more effectively compared with the other group of learners (teaching with the traditional method). In addition, students in the context of Excel-based instruction showed ability in picturing and interpreting data concentrated on normal distribution.

Keywords : statistics, excel-based instruction, data visualization, pedagogy

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