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Improving Teachers' Data Visualization Skills Using Microsoft Excel to Support SDG 4

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ABSTRACT

Objective: The community service program aims to improve teachers' knowledge and skills in data visualization using Microsoft Excel to support effective data management and evidence-based educational decision-making in the digital era, in line with SDG 4 (Quality Education). **Method:** The program was implemented through hands-on training for teachers at Fajrul Karim Islamic Boarding School, Serang, Banten. The training combined lectures, demonstrations, guided practice, and discussions. The learning materials included data organization, descriptive statistics, pivot tables, and chart creation using Microsoft Excel. Participants practiced applying these features to analyze and visualize student assessment data. **Results:** The training successfully enhanced participants' understanding and practical skills in organizing, analyzing, and visualizing educational data using Microsoft Excel. Teachers were able to transform student assessment data into informative visual representations, enabling them to interpret learning outcomes more effectively and support data-driven educational practices. Participants also demonstrated improved confidence in utilizing Excel for routine academic data management. **Novelty:** The program integrates statistical data analysis and visualization techniques into Microsoft Excel training specifically designed for teachers in an Islamic boarding school setting. The combination of practical statistical applications and digital literacy development provides an effective approach to strengthening teachers' competencies in educational data management and supports the implementation of quality education through technology-based capacity building.

INTRODUCTION

Excel is a number processing software that is quite popular because it has complete features (Chen et al., 2024; Mafarja et al., 2023; Mustafy & Rahman, 2024; Plauska et al., 2022). Various types of calculation and data processing processes can be done quickly using Excel, including creating diagrams and graphs in data visualization (Healy, 2024; Kharakhash, 2023; Schwabish, 2023). Excel dashboards can be created from a combination of diagrams, graphs and readily available tools (Alexander, 2022; Apellániz et al., 2024; Schroeder et al., 2022). Dashboards can help users display data, from simple tables to displays that are visually attractive and have clear meaning for readers. Physics is a complex and difficult science, so innovative strategies are needed to increase students' interest in learning physics.

Data visualization is used to display data in an interesting, interactive way without leaving out information (Aigner et al., 2023; Korkut & Surer, 2023; Steed, 2025). Data visualization uses visual elements such as charts, graphs and maps to represent data into information (Berinato, 2023; Wong, 2023). It shows trends, patterns, and outlines in the data. Information can be conveyed more easily with this method. An organization with large data collections needs a method to make it easier to read and analyze it. Visualization is the transformation of data into visual form (tables or graphs) so that the