

UNIVERSITI TEKNOLOGI MARA

TECHNICAL REPORT

**THE INTEGRATED MEREC OF HERONIAN MEAN WITH VIKOR
AND IT'S APPLICATION IN DECISION MAKING**

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IN THE NAME OF ALLAH, THE MOST GRACIOUS, THE MOST MERCIFUL.

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ABSTRACT

In this study, we employ the Method Based on the Effect of Criterion Elimination (MERECE), Heronian Mean (HM), and Vise Kriterijumska Optimizacija I Kompromisno Resenje (VIKOR) methods to select an appropriate topic for the Final Year Project (FYP). The data collected through a survey is utilized to calculate the HM results in the form of a matrix. Subsequently, the MERECE is applied to derive the weights for each criterion, with the highest weight being assigned to criterion 2. The utilization of the Heronian Mean offers distinct advantages over the traditional arithmetic mean used in the original MERECE. Unlike the arithmetic mean, which treats all values equally without considering their individual magnitudes, the Heronian Mean accounts for the impact of each data point based on the square root of their product. Consequently, greater values have a more significant influence on the outcome, allowing for a more comprehensive representation of the dataset's numerical values. The study examines the advantages and disadvantages of various potential project topics, using HM, MERECE, and VIKOR to calculate the weight of 11 criteria and establish a rank list. This enables the identification of the most suitable topic for selection, providing vital insights into its impact on the study's progress and future research directions. To achieve this, a survey is conducted, where each group member contributes their input. The aggregated decisions are then processed using HM to obtain weighted criteria via the MERECE method. VIKOR is subsequently utilized to analyze the criteria weights and produce the rank list. This approach enables prediction and explanation of the rank based on variables. This research aims to understand the characteristics of appropriate criteria for the topic and their utilization in Multi-Criteria Decision Making (MCDM). By implementing the proposed methods, which incorporate the advantageous Heronian Mean (HM), this study offers accurate insights into the criteria and ranking, enhancing the decision-making process for selecting the most suitable FYP.