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# FAN-Cycle: A Semi-Self-Charging Fan Powered by Flywheel and Dynamo Circulation

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## ABSTRACT

The researchers aimed to make a semi-self-charging fan from a dynamo and flywheel circulation by converting mechanical energy into electrical energy to prolong the fan's operation without relying on external energy resources, since large-scale energy consumption results in the depletion of non-renewable energy sources. To achieve this, the shafting, bearing, flywheel, and eight metal pillars were fabricated to suit the size and weight of the fan blades. A 16x16 plywood board was installed to attach the prototype to the dynamo. The battery was connected to the charging circuit, which contained capacitors, diodes, and resistors through wiring, creating a self-charging fan. The researchers employed an experimental approach, with no sampling method since the researchers picked the sample size. The data, which includes voltage output and revolutions per minute (rpm), were analyzed using descriptive and inferential statistics, presenting the mean, minimum, maximum, and standard deviation to understand the underlying variability between the sample sizes and the difference between the two groups. The study results showed that the mean voltage output was 12.66 V, while the mean revolutions per minute were 1988.88 rpm. The results indicate that, although there was no statistically significant difference between the controlled set-up, where the fan operated

without the integrated flywheel and dynamo mechanism, and the experimental set-up, the latter consistently demonstrated longer operational duration. Lastly, this study further demonstrates the potential of flywheels for efficient mechanical-to-electrical energy conversion by offering insights to optimize energy transfer and advance renewable energy applications.

*Keywords:* dynamo, energy, flywheel, pulley, shafting