

---

# Enhancing the Teaching and Learning Process of Faraday's and Lenz's Laws in Electromagnetic Induction using EM-Kit

Pek Chun Hoe<sup>1</sup>, Ronald Francis<sup>2</sup>, Akhmal Sofia Asykin<sup>3</sup>,  
Mohd Al-Amin Bin Abdullah<sup>4</sup>, Muhammad Anwar Bin Ahmad<sup>5</sup>

<sup>1,2,3,4,5</sup> Physics Unit, Department of Science, Kolej Matrikulasi Labuan, WP Labuan, Malaysia.  
E-mail: [bm-3278@moe-dl.edu.my](mailto:bm-3278@moe-dl.edu.my)

---

## *Abstract*

Faraday's and Lenz's Laws are two central concepts in Electromagnetic Induction that appears challenging to students due to difficult terms in their definitions in absence of any hands-on experimental tool. EM-Kit, utilizing magnet, copper coil, PVC pipe, multiple LEDs, and oscillation ruler level, is therefore developed as active learning strategy to enhance the teaching and learning process of this topic. A two-cycled action research was conducted in collaboration of five physics lecturers in Kolej Matrikulasi Labuan (KML) towards three classes of sixty-seven students undertaking one-year matriculation program. Data was collected through observation, document analysis, and interviews with lecturers and students. Result showed that students are able to explain qualitatively the working principles of these concepts via physical tools, such as LED lighting and ruler oscillation. Students could also relate them to real-life electric generator and household AC current. In conclusion, the activity succeeded in encouraging students to learn actively by having them apply their understanding of Faraday's and Lenz's Laws through practical experience rather than just listening to lectures.

**Keywords :** *Action Research; Active Learning; Electromagnetic Induction; EM-Kit; Faraday's Law; Lenz's Law*

---