

Enhancing Mechanical Engineering Education in Zimbabwe Through Identifying Critical Equipment, Facilities, and Maintenance Strategies for Effective Training at Universities By

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Abstract

Enhancing practical skills training at universities requires the availability, adequacy, relevance, and proper maintenance of critical equipment and facilities. Improper maintenance of workshop facilities hampers effective teaching and the acquisition of skills. In this regard, this paper focuses on investigating the equipment needed for mechanical engineering institutional workshops, its failures, and its maintenance. Mixed methods were used, including a review of work on critical equipment for comprehensive engineering training based on educator and employer perspectives, with online research and physical visits employed to carry out observations. Microsoft Excel and Microsoft Access were used to analyze data and develop a computerized maintenance system to support the maintenance of training equipment and facilities. A priority list of essential facilities and machinery was developed, and maintenance plans were proposed based on a pilot study of two key machine tools, the milling machine and lathe, which were used in the experimental construction of an automated maintenance management system. This study can be utilized to enhance the skills and proficiencies of mechanical engineering graduates, enabling them to be employable and contribute positively to solving social and economic challenges.

Keywords: Workshop Facilities, Mechanical Engineering, Equipment Maintenance, Mixed Methods, Maintenance Management System.