

**HIRARC ON WASTE DISPOSAL AT
TEACHING AND LEARNING LABORATORY
AND SAFETY PRACTICES AMONG
LABORATORY STAFF**

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AUTHOR'S DECLARATION

I declare that the work in the thesis was carried out in accordance with the regulation of Universiti Teknologi MARA. It is original and is the results of my own, unless otherwise indicated or acknowledge as reference work.

I, hereby acknowledge that I have been supplied with the Academic Rules and Regulations, Universiti Teknologi MARA, regulating the conduct of my study and research.

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We declared that we read this thesis and in our point of view this thesis is qualified in terms of scope and quality for the purpose of awarding the Bachelor of Chemical Engineering (Environment) with Honours.

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ABSTRACT

Teaching and learning laboratories provide academic assistance in all subject areas which often generate many types of hazardous wastes such as chemical waste, biological/ regulated medical wastes, sharps and laboratory glassware. Proper laboratory waste disposal management as well as safety practice, is significant to maximize safety and minimize environmental impact. This study is initiated to identify the current and potential hazards, to estimate the risk and to propose control measures for waste disposal process at teaching and learning laboratory in UiTM Cawangan Pulau Pinang based on Hazard Identification, Risk Assessment and Risk Control (HIRARC) model. Furthermore, this study also assesses the safety practices on waste disposal of the laboratory staff as well as the individual risk estimate on the hazard at teaching and learning laboratory. The hazard was identified by using hazard checklist, workplace inspection and interview session with the laboratory staff. The risk assessment was carried out for each of the hazard identified and the risk level was determined based on severity and likelihood of occurrence. A questionnaire with a sample size of 50 was distributed among laboratory staff to assess the knowledge and safety practice on the waste disposal process in the laboratory which was analyzed using SPSS. A total of fifty-seven important hazards were identified in the waste disposal process. The HIRARC result shows that 51% of the hazard are of medium risk followed by high risk and low risk at 30% and 19% respectively. This shows that the waste disposal process can be considered as risky to the laboratory staff. Majority of the hazards are chemical hazard at 47%, physical, 30%, biological, 16 % and ergonomics at 7%. High risk was associated with chemical and biological hazard. Control measures should be applied to eliminate or reduce the risk especially for high risk activities. This include engineering control, administrative control and PPE. Safety practices among laboratory staff were acceptable but some improvement are needed in the area of chemical waste management which can be enhanced by providing more education and training for laboratory staff.