Editorial

[AET Volume 2 Nomor 3] Environmental, medical, and educational research sustainability in the age of technology: An editorial review

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The six articles on Applied Engineering and Technology Volume 2 No 3 December 2023 have significant relevance in current engineering and technological developments to the three sectors: **Environmental sustainability, Medical,** and **Education**.

First, in an era that increasingly pays attention to **environmental sustainability**, as reflected in efforts to mitigate the environmental impact of the oil and gas industry, Effiom's research on developing bio-based drilling fluid becomes relevant and reflects the industry's efforts to adopt environmentally friendly solutions in the oil and gas exploration process [1]. This research develops and optimizes local pear seed-based biocyte fluid. Throughout the world, oil exploration and exploitation have had severe environmental impacts. So, it is very important to develop drilling fluid for oil exploration. This research optimizes drilling fluids by using biodegradable materials. The optimized drilling fluid contains environmentally friendly and cost-effective characteristics and is expected to be widely used in oil exploration, reducing adverse environmental impacts. Princewill *et al.* [2] conducted a safety and economic evaluation of boil-off gas (BOG) in global petroleum (LPG) storage tanks. BOG production impacts safety and economic profitability in the liquefied petroleum gas supply chain. This research evaluates BOG production due to heat leaks in storage tanks by analyzing thermodynamic properties and heat transfer equations. The research results show that maintaining isolation and external factors minimizes BOG formation. Therefore, this research provides essential guidance and suggestions for the safety and economic benefits of the liquefied petroleum gas supply chain. Finally, Yudanto *et al.* [3] used computational fluid dynamics (CFD) and Taguchi methods to calculate the CPU cooling system. The performance and stability of electronic devices are significant for users in today's rapid development of information technology. This study analyzes the impact of different cooling system configurations on CPU temperatures and provides practical insights into electronic thermite design. Through numerical simulations, the research results provide an essential reference for developing computer hardware design.

Second, Agughasi and Srinivasiah [4] developed a semisupervised method for characterizing multiple chest X-ray images in the **medical** field. Accurate marker images are critical for training supervised learning models in medical image handling. However, manually tagging a large number of images requires time and effort. Therefore, this study suggests using unsupervised cluster technology-based K-Means and Self-Organizing Maps to produce reliable images. In this way, medical imaging processing costs can be reduced significantly, speeding up the research and application process.

Meanwhile, in the **education** sector, Mariscal *et al.* [5] developed the mobile application MobILcaps to improve information literacy for social science students in higher education as a relevant instrument to facilitate teaching. Information literacy is crucial for developing individuals and society in today's information era. Based on cognitive, constructivist, and connectivity theories, this application has provided multimedia resources for students to facilitate independent learning. By working with teachers and students, this application provides practical tools and avenues for increasing students' information literacy levels. In addition, Riva *et al.* [6] developed AdPisika as an electronic learning system tailored to improve student academic achievement. In today's educational environment, personalized learning is critical to increasing the impact of learning for students. This research, based on learning style models

and machine learning algorithms, personally optimizes learning materials, thereby improving students' learning performance. This system has significantly improved students' academic performance through experimental verification, providing practical ways to align education.

In conclusion, these studies make essential contributions and provide valuable references and guidance for applying engineering and technology research and practice in the fields of **Environmental sustainability, Medical,** and **Education**. Future research could investigate the depth and breadth of these areas and test the feasibility and effectiveness of such research through practical applications and experimental testing. In the context of environmental sustainability potential research includes exploration in the development of bio-based drilling fluid using alternative materials that are more environmentally friendly, research on green technology to reduce the impact of boil-off gas (BOG) in the LPG industry, and research on processor types and system configurations as well as the development of more efficient materials and more innovative cooling technology to improve the performance of the CPU cooling system. In the medical field, deepen semi-supervised labeling methods for medical image processing can focus on developing more sophisticated algorithms and further validation of various medical datasets. Meanwhile, in the educational context, developing broader mobile applications could increase information literacy. It could be useful if it adapted to various disciplines and research on integrating more advanced AI technology for adaptive e-learning systems more effectively.

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