International Journal of Research and Review
Volume 11; Issue: 12; December 2024
Website: www.ijrrjournal.com
Research Paper *E-ISSN: 2349-9788; P-ISSN: 2454-2237*

Electric Motor Conversion Curriculum Development Training at Electrical Vocational School in Kotabumi, North Lampung

Appin Purisky Redaputri[1], M. Oktaviannur[2], Muhammad Riza[3], Robby Yulli Endra[4], Hendri Dunan[5]

[1,5]Department of Economics and Business, [2]Department of Business Administration, [3]Department of Mechanical Engineering, [4]Department of Computer,
Universitas Bandar Lampung, Lampung, Indonesia.

Corresponding Author: Appin Purisky Redaputri

DOI: https://doi.org/10.52403/ijrr.20241227

ABSTRACT

This article focuses on developing an electric motor conversion curriculum for vocational high schools in Kotabumi, North Lampung, Indonesia. As the demand for sustainable transportation solutions grows, driven by environmental concerns and government regulations, the transition from internal combustion engine (ICE) motorcycles to electric alternatives is becoming increasingly important. The study emphasizes the significance of equipping students with technical skills related to electric vehicle technology, enabling them to adapt to the evolving automotive industry. By integrating practical training on electric motor conversion into the curriculum, vocational schools can enhance students' employability while fostering a culture of environmental responsibility. The findings suggest that such educational initiatives contribute to reducing urban air pollution and align with global efforts to combat climate change, ultimately preparing students for a greener future in transportation.

Keywords: Electric Motor Conversion Curriculum, Vocational High Schools, Environmental Sustainability and Technical Skills Development

INTRODUCTION

The trend of electric motorbikes in Indonesia is gaining significant momentum, driven by environmental concerns, government regulations, and technological advancements. As one of Southeast Asia's most significant contributors to pollution, Indonesia must do transition from conventional internal combustion engine (ICE) motorcycles to electric alternatives. Promoting electric motorbikes aligns with the principles of a green economy, which emphasizes sustainable development while addressing societal needs and environmental impacts (Latifah, 2022). The Indonesian government has recognized this necessity and has implemented regulations, such as Presidential Regulation No. 55 of 2019, to accelerate the adoption of battery-based electric vehicles, including electric motorcycles (Rahmawati et al., 2023).

The electric motorbike market in Indonesia is characterized by two primary categories: newly designed electric motorbikes and convertible electric motorbikes, which allow users to retrofit existing ICE motorcycles with electric components. This innovation supports pollution reduction and provides a feasible transition for consumers who may be hesitant to invest in entirely new vehicles (Rahmawati et al., 2023). The increasing number of motorcycles in Indonesia, which

reached approximately 120 million units in 2018, underscores the potential impact of electric motorbikes on reducing urban air pollution and improving public health (Istiqomah et al., 2022). Furthermore, advancements in battery technology, particularly the shift from lead-acid to lithium-ion batteries, have enhanced the performance and appeal of electric motorbikes, making them a more viable option for consumers (Shahjalal et al., 2022).

Public perception and acceptance of electric motorbikes are crucial for their successful commercialization. Research indicates that while there is a growing interest in electric vehicles, factors such as infrastructure readiness and affordability significantly influence consumer adoption (Utami et al., 2020). Studies have shown that community satisfaction with electric motorbikes is improving, particularly in urban areas where charging infrastructure is being developed (Narendra & Irawati, 2023). Moreover, sentiment analysis of social media discussions reveals a notable interest in electric vehicles, suggesting a shift in consumer attitudes toward more sustainable transportation options (Salsabila et al., 2023). However, challenges remain, including the need for widespread charging stations and public awareness campaigns to educate potential users about the benefits of electric motorbikes (Istiqomah et al., 2022).

The conversion of traditional motorbikes to electric motorbikes is increasingly recognized as a significant innovation in the transportation sector. This transformation not only addresses the urgent need for sustainable mobility but also enhances the competitiveness of existing motorbike owners by providing them with an alternative that does not necessitate the purchase of a new vehicle. Rahmawati emphasizes that the conversion process is a form of management innovation that stems from creativity and aims to improve customer satisfaction and market competitiveness (Rahmawati et al., 2023). Furthermore, the conversion of internal combustion engine (ICE) motorbikes to electric models prolongs the lifespan of these vehicles while simultaneously reducing carbon emissions, thereby contributing to environmental sustainability (Imansuri, 2024).

The technical aspects of electric motorbikes, particularly the incorporation of advanced systems such as regenerative braking, further enhance their appeal. This system allows electric motorbikes to recover energy during braking, converting kinetic energy back into electrical energy, which can be stored in the battery for future use (Buana et al., 2023). Such innovations not only improve the efficiency of electric motorbikes but also align with the broader goals of reducing reliance on fossil fuels and minimizing the environmental impact of transportation. As demonstrated in Ghana, the economic analysis of converted electric vehicles reveals that such conversions can be profitable while also addressing the growing demand for eco-friendly transportation options (Adjei et al., 2023). This dual benefit of economic viability and environmental responsibility underscores the importance of converting traditional motorbikes to electric alternatives.

Moreover, the societal acceptance of electric motorbikes is gaining traction, as evidenced by various studies conducted in regions like Indonesia and Surabaya, where local governments are actively supporting the integration of electric vehicles through infrastructure development, such as Electric Fuel Filling Stations (Narendra & Irawati, 2023). This governmental support is crucial in fostering a conducive environment for adopting electric motorbikes, as it addresses the practical challenges associated with charging and maintenance. The increasing awareness of environmental issues among consumers also drives the transition toward electric motorbikes as individuals seek to reduce their carbon footprint (Nguyen-Phuoc et al., 2023).

The study of electric motor conversion is essential in the context of vocational high schools (SMK), particularly as the world shifts towards more sustainable

transportation solutions. Electric motorbike conversion training programs, such as those implemented in Kotabumi, North Lampung, are pivotal in equipping students with the necessary technical skills to adapt to the growing demand for electric vehicles (EVs) (Redaputri, 2024). This training enhances the student's employability and fosters a culture of environmental responsibility by promoting the adoption of eco-friendly technologies. By integrating practical training on electric motor conversion into the curriculum, vocational schools can prepare students to meet the challenges posed by the electricity-based transportation revolution, thereby contributing to a greener future (Redaputri, 2024).

Moreover, implementing the Merdeka Curriculum in vocational high schools emphasizes the importance of adapting educational programs to meet the needs of the industry (Satriyanto, 2023). This curriculum allows for greater flexibility in teaching methods and content, enabling educators to incorporate relevant topics such as electric motor technology and conversion processes into their lessons. By aligning the curriculum with current technological advancements, vocational schools can ensure that students acquire theoretical knowledge and practical skills directly applicable to the workforce. This alignment is crucial as the automotive industry increasingly relies on electric propulsion systems, necessitating a knowledgeable workforce about electric motors and their applications (Azizah et al., 2023; Zainuri et al., 2023).

The significance of studying electric motor conversion extends beyond technical skills; it also encompasses broader educational goals. As vocational schools aim to develop competencies that align with the demands of Society 5.0, integrating electric vehicle technology into the curriculum becomes imperative (Wibawanto et al., 2021). This integration supports the development of green skills among students, preparing them to contribute to sustainable development initiatives in their communities. Furthermore, the focus on electric motor conversion aligns with global efforts to reduce greenhouse gas emissions and combat climate change, making it a socially responsible educational endeavor (Udianto et al., 2022).

LITERATURE REVIEW

Curriculum

The vocational high school (VHS) curriculum prepares students for the workforce by equipping them with the necessary skills and knowledge tailored to industry demands. A production-based curriculum is essential, as it aligns educational outcomes with the expectations of employers. Yoto emphasizes that the success of vocational education should not only be measured by students' academic achievements but also by their performance in the workplace after graduation (Yoto, 2018). This perspective is echoed by Adewale et al., who argue for a comprehensive and standardized curriculum that ensures students acquire the requisite skills for their chosen vocations, thereby enhancing their employability (Adewale et al., 2017). Furthermore, the curriculum must adapt to the industry's evolving needs, ensuring that students are well-prepared for the challenges they will face in their careers (Weiss et al., 2015).

The integration of English language skills into the vocational curriculum is another critical aspect that enhances students' readiness for the global job market. This aligns with the findings of Astuti, who highlights the necessity for curriculum and materials that are directly relevant to students' majors, ensuring that they possess the language skills required for effective communication in their future workplaces (Astuti & Kokom Nurjanah, 2023). Moreover, the Content and Language Integrated Learning (CLIL) approach, as explored by Mukadimah and Sahayu, demonstrates positive outcomes in teaching English for Specific Purposes (ESP) within vocational contexts, further emphasizing the

importance of language skills in vocational education (Mukadimah & Sahayu, 2021).

The effectiveness of vocational curricula is also influenced by the teaching methodologies employed. As investigated by Chiang and Lee, project-based learning has been shown to enhance students' motivation and problem-solving abilities, which are vital skills in any vocational field (Chiang & Lee, 2016). Additionally, the Merdeka Curriculum, which allows for greater flexibility and student involvement in the learning process, has been positively received in vocational schools, as noted by Satriyanto (Satriyanto, 2023). This curriculum empowers teachers to tailor their instruction to meet the specific needs of their students, fostering a more engaging and relevant educational experience.

However, challenges remain in aligning the vocational curriculum with actual student needs and industry requirements. The research by Wirawan et al. highlights a disconnect between what is taught and what students need to learn, suggesting that a thorough needs analysis is essential for curriculum development (Fajar Wirawan et al., 2022). Furthermore, the integration of green skills into vocational education is becoming increasingly important, as noted by Handayani et al., who advocate for curriculum development that supports sustainable practices in various vocational fields (Handayani et al., 2021). This aligns with the broader goals of preparing students for immediate employment and contributing to sustainable development in their respective industries.

Electric Motorcycle Conversion

Electric motorcycle conversion has emerged as a significant area of research and development, driven by the need for sustainable transportation solutions and the desire to reduce carbon emissions. The process involves retrofitting internal combustion engine (ICE) motorcycles with electric motors and battery systems, extending existing vehicles' lifespan while contributing to environmental sustainability. Zainuri highlights that electric vehicle conversion can be a cost-effective alternative to purchasing new electric vehicles, particularly for older models that still possess considerable utility (Zainuri et al., 2023). This economic aspect is further supported by Imansuri, who emphasizes that converting ICE motorcycles can significantly reduce carbon emissions and air pollution, aligning with sustainable development goals (Imansuri, 2023).

The technical aspects of electric motorcycle conversion involve selecting components such as electric motors, batteries, and controllers. Habibie et al. discuss the conversion process in detail, noting that replacing ICE with brushless DC motors and Lithium Iron Phosphate (LFP) batteries is a common approach (Habibie et al., 2021). Lacerda expands on this by comprehensively analyzing the operational feasibility of such conversions, addressing critical factors like performance, range, and charging times (Moreira de Lacerda et al., 2023). The importance of proper sizing and selection of components is also echoed in the work of Tahoori and Mashad, who focus on optimizing fuel consumption and performance in hybrid electric motorcycle designs (Tahoori & Mashadi, 2019).

Moreover, the environmental implications of converting ICE motorcycles to electric models are substantial. Xuan et al. provide a life-cycle assessment that reveals a potential reduction in life-cycle energy consumption and greenhouse gas emissions by 72% and 45%, respectively, when converting to electric motorcycles (Xuan et al., 2013). This aligns with Weiss et al.'s findings that electric two-wheelers are generally more energy-efficient and less polluting than their conventional counterparts, thus contributing to lower urban pollution levels (Weiss et al., 2015). The environmental benefits are complemented by the economic advantages highlighted by Teo et al., who argue that large-scale conversions can lead to significant operational cost savings, making electric motorcycles a financially viable option (Teo et al., 2014).

Training and education are crucial in facilitating the transition to electric motorcycle technology. Redaputri emphasizes the importance of vocational training programs to equip students and mechanics with the necessary skills for electric motorbike conversion (Redaputri, 2024). This educational approach prepares future workers for the evolving transportation landscape and fosters local adoption of environmentally friendly technologies. Furthermore, the regulatory framework supporting electric motorcycle conversion, as discussed by Soemanto, indicates governmental efforts to promote this transition through financial incentives and rigorous safety testing (Soemanto et al., 2023).

Previous Research on Electric Motorcycle Conversion

The research on electric motorcycle conversion has gained traction in recent years, driven by the increasing need for sustainable transportation solutions and the desire to reduce greenhouse gas emissions. One pivotal study by Habibie et al. evaluates the sustainability of converting internal combustion engine (ICE) motorcycles to electric motorcycles, highlighting the technical aspects of the conversion process, including the replacement of the ICE with brushless DC motors and Lithium Iron Phosphate (LFP) batteries (Habibie et al., 2021). This study underscores the potential environmental benefits of such conversions, as they can significantly reduce emissions and energy consumption, aligning with global sustainability goals.

In addition to the technical feasibility, consumer preferences play a crucial role in the adoption of electric motorcycles. Suparmadi et al. explore the design preferences of Indonesian consumers using a Kansei engineering approach, identifying that specifications and functional factors are significant barriers to switching from gasoline-powered motorcycles to electric alternatives (Suparmadi et al., 2021). Their findings suggest that while economic efficiency and comfort are primary motivators for consumers, the perceived limitations of electric motorcycles must be addressed to enhance market acceptance. This aligns with the work of Jones et al., who conducted a stated choice experiment in Vietnam, revealing that incentives and technological advancements significantly influence the adoption of electric motorcycles (Jones et al., 2013).

The operational feasibility of electric motorcycle conversion has also been a focal point in the literature. Lacerda's study provides a comprehensive analysis of the conversion process, discussing critical components such as performance, range, and charging time, which are essential for ensuring the practicality of electric motorcycles in everyday use (Moreira de Lacerda et al., 2023). Furthermore, the research by Xuan et al. presents a life-cycle assessment of converted electric motorcycles, demonstrating a substantial reduction in life-cycle energy consumption and greenhouse gas emissions, thereby reinforcing the environmental advantages of such conversions (Xuan et al., 2013).

Moreover, the economic implications of electric motorcycle conversion are significant. Teo et al. argue that large-scale conversions can lead to substantial cost savings for consumers, making electric motorcycles a financially viable alternative to ICE motorcycles (Teo et al., 2014). This economic perspective is complemented by Imansuri's investment feasibility study, which emphasizes the potential for electric motorcycle conversion to extend the lifespan of existing motorcycles while contributing to reduced carbon emissions and air pollution (Imansuri, 2023).

Training and education are also critical in facilitating the transition to electric motorcycle technology. Redaputri highlights the importance of vocational training programs that equip students and mechanics with the necessary skills for electric motorcycle conversion, thereby fostering local adoption of this technology (Redaputri, 2024). This educational approach prepares

future workers for the evolving transportation landscape and promotes the environmental benefits of electric motorcycles.

MATERIALS & METHODS

Preparing an Electric Motor Conversion Curriculum Training at vocational high schools involves systematically equipping students with the necessary skills and knowledge to convert internal combustion engine (ICE) motorcycles to electric motorcycles. This training is essential as it aligns with the growing demand for sustainable transportation solutions and prepares students for future employment in the automotive industry.

Developing a curriculum for electric motorcycle conversion involves several key steps, each crucial for ensuring students acquire the necessary skills and knowledge. The initial phase in preparing the curriculum is conducting a needs assessment to identify the specific skills and knowledge required for electric motorcycle conversion. This assessment should involve consultation with industry stakeholders, including motorcycle manufacturers and repair shops, to ensure the curriculum meets current market demands (Redaputri, 2024). The curriculum should encompass essential topics such as electric motor types, battery technologies, and the principles of electric vehicle operation (Habibie et al., 2021). Furthermore, it is vital to integrate theoretical knowledge with practical skills to provide a comprehensive learning experience (Redaputri, 2024).

After developing the curriculum, the next step is to implement theoretical training sessions. These sessions should cover fundamental concepts related to electric motorcycles, including the advantages of electric over internal combustion engine (ICE) motorcycles, such as lower emissions and reduced maintenance costs (Boretti, 2023). Students should gain insights into components involved in electric motorcycle conversion, such as brushless DC motors, controllers, and Lithium Iron Phosphate (LFP) batteries (Habibie et al., 2021). To enhance understanding and engagement, theoretical training can be supplemented with multimedia presentations and case studies (Redaputri, 2024).

Following the theoretical training, students should engage in hands-on workshops to apply their knowledge in real-world scenarios. These workshops should provide opportunities for students to work on actual motorcycle conversions, allowing them to gain practical experience in dismantling ICE motorcycles and installing electric components (Redaputri, 2024). Instructors should guide students through the conversion process, emphasizing safety protocols and best practices for handling electrical systems (Redaputri, 2024). This practical exposure is essential for reinforcing theoretical concepts and building students' confidence in their skills.

Assessments should be conducted throughout the training program to ensure students learn the necessary skills effectively. These assessments may include practical exams where students demonstrate their ability to convert a motorcycle and theoretical tests to evaluate their understanding of the concepts taught (Redaputri, 2024). Incorporating feedback from instructors and peers will help students identify areas for improvement and enhance their overall learning experience.

Finally, establishing partnerships with local motorcycle repair shops and manufacturers can provide students with additional learning opportunities and potential job placements upon graduation. Collaborating with industry professionals can also develop certification programs that validate students' skills in electric motorcycle conversion (Redaputri, 2024). Such certification can enhance students' employability and give them a competitive edge in the job market.

RESULT AND DISCUSSION

The transition from traditional internal combustion engine (ICE) motorcycles to electric alternatives is driven by environmental concerns, government

initiatives, and technological advances. As one of Southeast Asia's largest polluters, Indonesia faces significant pressure to adopt more sustainable transportation solutions. The government's commitment is evident through regulations such as Presidential Regulation No. 55 of 2019, which aims to accelerate the adoption of battery-powered vehicles, including electric motorcycles. This regulatory framework supports the development of two main categories in the electric motorcycle market: newly designed electric models and convertible motorcycles that allow users to retrofit existing ICE motorcycles with electric components. Such innovations facilitate a smoother transition for consumers, reduce pollution, and improve public health, particularly in urban areas where motorcycle use is prevalent.

The results indicate a positive trajectory for accepting and commercializing electric motorbikes in Indonesia. Research shows that community satisfaction with electric motorbikes is rising, particularly in urban settings where charging infrastructure is being established. Sentiment analysis from social media platforms reveals a growing interest in electric vehicles, suggesting a shift in consumer attitudes towards sustainable transportation options. However, challenges persist, including the need for widespread charging stations and comprehensive public awareness campaigns to educate potential users about the benefits of electric motorbikes. Economic analyses demonstrate that converting ICE motorbikes to electric models can be profitable and environmentally responsible, aligning with global trends toward eco-friendly transportation solutions.

Furthermore, the importance of integrating electric motor conversion training into the vocational high school curriculum is discussed. This educational approach equips students with essential technical skills needed in an evolving job market increasingly focused on sustainability. By incorporating practical training on electric motor conversion, vocational schools can prepare students to meet industry demands while fostering a culture of environmental responsibility. Implementing flexible curricula allows educators to adapt teaching methods and content to include relevant topics such as electric vehicle technology, ensuring that students acquire theoretical knowledge and practical skills applicable in the workforce.

Picture 1. Electric Motor Conversion Curriculum Development Training

CONCLUSION

Developing an electric motorcycle conversion curriculum in vocational high schools (SMK) in Kotabumi, North Lampung, is essential in supporting the transition towards more sustainable transportation in Indonesia. With increasing awareness of environmental issues and support from the government through regulations that support the adoption of electric vehicles, this conversion training not only provides students with the necessary technical skills but also encourages environmental responsibility. Integrating electric motorcycle technology into the SMK curriculum aligns with industry needs and prepares students to face the challenges of the electric vehicle era. In addition, innovations such as the regenerative braking system increase the efficiency of electric motorcycles, making them a more attractive choice for consumers. Thus, this training program contributes to reducing carbon emissions and improving air quality in urban areas while strengthening students' competitiveness in the job market.

Declaration by Authors

Acknowledgement: None
Source of Funding: None
Conflict of Interest: The authors declare no conflict of interest.

REFERENCES

1. Adewale, B., Adisa, O., Ndububa, C., Olawoyin, O., & Adedokun, A. (2017). Attitude Of Students And Teachers Towards Vocational Education In Secondary Schools In Ota, Ogun State, Nigeria. *INTED2017 Proceedings*, *1*. https://doi.org/10.21125/inted.2017.1062
2. Adjei, F., Sperling, D., Atia-Abugbilla, I., Anokye, A., Appiah, J., Ayetor, G., & Severengiz, S. (2023). Converted and Shared Light Electric Vehicles in Ghana: A Technical and Economic Analysis Based on Converted ICE Motorbikes and e-mopeds. *Lecture Notes in Mechanical Engineering*. https://doi.org/10.1007/978-3-031-28839-5_114
3. Astuti, S., & Kokom Nurjanah. (2023). Teachers'perception on English Curriculum and Material in Vocational High School. *JOLADU: Journal of Language Education*, *2*(1). https://doi.org/10.58738/joladu.v2i1.341
4. Azizah, N. S., Adriyanto, F., & Saputro, J. S. (2023). Development of Control and Monitoring of BLDC Motor Speed without Sensor with Back Emf Detection. *Journal of Electrical, Electronic, Information, and Communication Technology*, *5*(1). https://doi.org/10.20961/jeeict.5.1.66698
5. Boretti, A. (2023). Comparison of Electric and Internal Combustion Engine SuperSport Bikes. *Energy Technology*, *11*(8). https://doi.org/10.1002/ente.202300226
6. Buana, F. K., Yudaningtyas, E., & Rusli, M. (2023). Efficiency of BLDC Motor Regenerative Braking System on Electric Motorcycles. *Jurnal EECCIS (Electrics, Electronics, Communications, Controls, Informatics, Systems)*, *17*(3). https://doi.org/10.21776/jeeccis.v17i3.1658
7. Chiang, C. and Lee, H. (2016). The effect of project-based learning on learning motivation and problem-solving ability of vocational high school students. International Journal of Information and Education Technology, 6(9), 709-712. https://doi.org/10.7763/ijiet.2016.v6.779
8. Fajar Wirawan, Syaftinentian, W., & Astuti, P. (2022). What Teachers Teach Vs What Students Learn. *BATARA DIDI : English Language Journal*, *1*(2). https://doi.org/10.56209/badi.v1i2.45
9. Habibie, A., Hisjam, M., Sutopo, W., & Nizam, M. (2021). Sustainability evaluation of internal combustion engine motorcycle to electric motorcycle conversion. In *Evergreen* (Vol. 8, Issue 2). https://doi.org/10.5109/4480731
10. Handayani, M. N., Kamis, A., Ali, M., Wahyudin, D., & Mukhidin, M. (2021). Development of green skills module for meat processing technology study. *Journal of Food Science Education*, *20*(4). https://doi.org/10.1111/1541-4329.12231
11. Imansuri, F. (2023). Investment feasibility study of implementing electric conversion motorcycle in Indonesia: a sustainable development perspective. Journal Industrial Services, 9(2), 81. https://doi.org/10.36055/jiss.v9i2.19996
12. Istiqomah, S., Sutopo, W., Hisjam, M., & Wicaksono, H. (2022). Optimizing Electric Motorcycle-Charging Station Locations for

Easy Accessibility and Public Benefit: A Case Study in Surakarta. *World Electric Vehicle Journal*, *13*(12). https://doi.org/10.3390/wevj13120232

13. Jones, L. R., Cherry, C. R., Vu, T. A., & Nguyen, Q. N. (2013). The effect of incentives and technology on the adoption of electric motorcycles: A stated choice experiment in Vietnam. *Transportation Research Part A: Policy and Practice*, *57*. https://doi.org/10.1016/j.tra.2013.09.003
14. Latifah, E. (2022). PERAN EKONOMI SYARIAH DALAM MENDUKUNG TERWUJUDNYA SUSTAINABLE DEVELOPMENT GOALS (SDGs) DI INDONESIA. *AT TARIIZ : Jurnal Ekonomi Dan Bisnis Islam*, *1*(03). https://doi.org/10.62668/attariiz.v1i03.275
15. Moreira de Lacerda, L., Gabriel Sotero, V., Cuchi, R., De Carvalho Fernandes, A., Gonzaga Trabasso, L., De Jesus Schmitt Ballmann, T., & Zappelino Camillo, B. (2023). Operational Feasibility Study For The Conversion Of A Combustion Traction Motorcycle To Electric. *Revista E-TECH: Tecnologias Para Competitividade Industrial - ISSN - 1983-1838*, *16*(2). https://doi.org/10.18624/etech.v16i2.1278
16. Mukadimah, H., & Sahayu, W. (2021). Embedding Content and Language Integrated Learning (CLIL) into English for specific purposes curriculum for vocational high school. *Jurnal Pendidikan Vokasi*, *11*(2). https://doi.org/10.21831/jpv.v11i2.41065
17. Narendra, R. D. E., & Irawati, D. Y. (2023). Analysis of Community Satisfaction with the Use of Electric Motorbikes in the City of South Surabaya. *Jurnal Sains Dan Teknologi Industri*, *20*(2). https://doi.org/10.24014/sitekin.v20i2.21373
18. Nguyen-Phuoc, D. Q., Nguyen, N. A. N., Tran, P. T. K., Pham, H. G., & Oviedo-Trespalacios, O. (2023). The influence of environmental concerns and psychosocial factors on electric motorbike switching intention in the global south. *Journal of Transport Geography*, *113*. https://doi.org/10.1016/j.jtrangeo.2023.103705
19. Rahmawati, T. S., Sutopo, W., & Rochani, R. (2023). *The Role of Technological Entrepreneurship and Innovation System for Commercializing Electric Motorcycle Conversion Kit: A Case Study*. https://doi.org/10.46254/ap04.20230048
20. Redaputri, A. (2024). Electric motorbike conversion training to reduce pollution and create a friendly environment for society. Jurnal Cemerlang Pengabdian Pada Masyarakat, 6(2), 214-226. https://doi.org/10.31540/jpm.v6i2.2648
21. Salsabila, H., Habibi, R., & Harani, N. H. (2023). Social Media-Based Sentiment Analysis: Electric Vehicle Usage in Indonesia. *The Indonesian Journal of Computer Science*, *12*(3). https://doi.org/10.33022/ijcs.v12i3.3250
22. Satriyanto, K. (2023). ANALYSIS OF THE IMPLEMENTATION OF THE INDEPENDENT CURRICULUM AT VOCATIONAL HIGH SCHOOLS (SMK) CENTERS OF EXCELLENCE. *Journal of Social Research*, *2*(10). https://doi.org/10.55324/josr.v2i10.1468
23. Shahjalal, M., Shams, T., Hossain, S. Bin, Roy, P. K., Jion, A. A., Ahsan, M., Chowdhury, J. I., Ahmed, M. R., Alam, S. B., & Haider, J. (2022). A Numerical Thermal Analysis of a Battery Pack in an Electric Motorbike Application. *Designs*, *6*(4). https://doi.org/10.3390/designs6040060
24. Soemanto, A., Mohi, E., al Irsyad, M. I., & Gunawan, Y. (2023). The Role of Oil Fuels on the Energy Transition toward Net Zero Emissions in Indonesia: A Policy Review. *Evergreen*, *10*(4). https://doi.org/10.5109/7160867
25. Suparmadi, Y., Riyadi, S., & Junaidy, D. W. (2021). Indonesian Consumer Preference on Electric Motorcycle Design with Kansei Engineering Approach. *Journal of Visual Art and Design*, *13*(1). https://doi.org/10.5614/j.vad.2021.13.1.1
26. Tahoori, A., & Mashadi, B. (2019). Design of a Hybrid electric motorcycle for optimum fuel consumption and performance. *Latin American Applied Research*, *49*(1). https://doi.org/10.52292/j.laar.2019.282
27. Teo, B. S., Howe, A. S. S., Inna, S. C. R., Henz, M., & Dieter Weigl, J. (2014). To produce or convert: A case for large-scale electric motorcycle conversion in Singapore. *2013 World Electric Vehicle Symposium and Exhibition, EVS 2014*. https://doi.org/10.1109/EVS.2013.6914929
28. Udianto, P., Perdana, F. A., Viyus, V., & Alia, N. (2022). Experimental Research and Energy Consumption Analysis of a 350-watt

Brushless Electric Motor with LiFePO4 Battery. In *Proceedings of the 2022 Annual Technology, Applied Science and Engineering Conference (ATASEC 2022)*. https://doi.org/10.2991/978-94-6463-106-7_10

29. Utami, M. W. Dela, Yuniaristanto, & Sutopo, W. (2020). Adoption Intention Model of Electric Vehicle in Indonesia. *Jurnal Optimasi Sistem Industri*, *19*(1). https://doi.org/10.25077/josi.v19.n1.p70-81.2020
30. Weiss, M., Dekker, P., Moro, A., Scholz, H., & Patel, M. K. (2015). On the electrification of road transportation - A review of the environmental, economic, and social performance of electric two-wheelers. *Transportation Research Part D: Transport and Environment*, *41*. https://doi.org/10.1016/j.trd.2015.09.007
31. Wibawanto, H., Roemintoyo, R., & Rejekiningsih, T. (2021). Indonesian Vocational High School Readiness Toward Society 5.0. *Journal of Education Research and Evaluation*, *5*(1). https://doi.org/10.23887/jere.v5i1.31567
32. Xuan, P. Y., Henz, M., & Weigl, J. D. (2013). Environmental impact of Converted Electrical Motorcycle. *World Electric Vehicle Journal*, *6*(4). https://doi.org/10.3390/wevj6041136
33. Yoto, Y. (2018). *Production-Based Curriculum Development in Vocational High Schools for Preparing Skilled Labor in Industry*. https://doi.org/10.2991/aptekindo-18.2018.38
34. Zainuri, F., Hidayat Tullah, M., Prasetya, S., Susanto, I., Purnama, D., Subarkah, R., Ramiati, T., Widiyatmoko, & Noval, R. (2023). Electric Vehicle Conversion Study for Sustainable Transport. *Recent in Engineering Science and Technology*, *1*(02). https://doi.org/10.59511/riestech.v1i02.15

How to cite this article: Appin Purisky Redaputri, M. Oktaviannur, Muhammad Riza, Robby Yulli Endra, Hendri Dunan. Electric motor conversion curriculum development training at electrical vocational school in Kotabumi, North Lampung. *International Journal of Research and Review*. 2024; 11(12): 234-243. DOI: *https://doi.org/10.52403/ijrr.20241227*

******