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Review

Impact of Malaysia Accreditation of Prior Experiential Learning (APEL) Programme on Learning Experience

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Abstract: The Accreditation of Prior Experiential Learning (APEL) Programme in Malaysia is a significant initiative to recognize and accredite individuals' prior learning experiences, particularly through work, life, or informal learning. We examined the impact of the APEL in Malaysia, focusing on its implications for individuals, educational institutions, employers, and society. By analyzing the outcomes, challenges, and opportunities associated with APEL, the effectiveness and potential enhancements of the APEL were verified in promoting lifelong learning, skills development, and workforce inclusion in Malaysia.

Keywords: Inclusive Education, Accreditation of Prior Experiential Learning (APEL), Social and Economic Impacts

1. Introduction

The Accreditation of Prior Experiential Learning (APEL) Programme in Malaysia is a pioneering initiative for recognizing and accrediting individuals' learning experiences, particularly through work, life, or informal learning settings (MQA 2022, MQA 2018). Established by the Malaysian Qualifications Agency (MQA) in collaboration with educational institutions and industry partners, the APEL Programme provides a mechanism for individuals to obtain academic credits, qualifications, or certifications based on their existing knowledge, skills, and competencies (MOE 2017). In the APEL Programme, various levels of prior learning are recognized including certificate, diploma, undergraduate, and postgraduate qualifications as shown in Table 1. It involves a rigorous assessment conducted by qualified assessors, who evaluate evidence provided by applicants to determine their eligibility for credit transfer, exemptions, or direct entry into higher educational institutions (Fig. 1) (MQA 2020, Norani 2015, MQA 2023).

Malaysian Qualification Minimum Years of Working Experience in The Academic Sector Framework Level **Relevant Field** 3 Certificate 5 years Diploma 10 years Advanced Diploma 12 years Bachelor's Degree 15 years Master's Degree 20 years 8 Doctoral Degree 25 years

Table 1. Policies award of Certificate.

The objective of the APEL Programme is to promote lifelong learning. By recognizing and valuing individuals' prior experiential learning, the APEL Programme encourages lifelong learning to empower individuals to pursue further education and skill development throughout their lives (MHE 2013, MOE 2012). It contributes to enhancing access to education and allows for access to higher education. Individuals who may have non-traditional learning pathways or limited formal qualifications, including adult learners, mature students, and professionals seeking career advancement can join the program (MOE 2012, MHE 2015). It facilitate career progression by accrediting prior learning experiences. The APEL Programme enables individuals to leverage their existing knowledge and skills to advance their careers, pursue new job opportunities, or transition into different sectors or roles. By



promoting equality and inclusion, prior experiential learning helps to address barriers to education and training faced by marginalized or underserved individuals from low-income backgrounds, rural communities, or minority groups. Fostering innovation and creativity is the APEL Programme's main purpose to acknowledge diverse learning experiences and perspectives, thereby enriching educational environments and fostering a culture of innovation within institutions and industries (Ooi 2019, Leong 2024a).



Fig. 1. Accreditation of prior experience learning (APEL).

2. Implementation and Recognition

One of the main issues about APEL is its implementation and recognition (Fig. 2). While APEL offers an alternative pathway for individuals without formal academic qualifications to gain entry into public universities based on their experiential learning, there are several challenges to implementation and recognition. Many employers and institutions may not fully understand or recognize the value of APEL qualifications compared to traditional academic qualifications. This lack of recognition hinders the employment prospects of APEL graduates and may also affect their ability to pursue further education (Leong 2022). Ensuring consistency and fairness in assessing experiential learning is also challenging. Thus, it is crucial to develop standardized assessment criteria and processes that accurately evaluate the competencies gained through work experience and informal learning

There may be a stigma associated with alternative pathways to education, leading to perceptions that APEL candidates are less capable or qualified compared to those with traditional academic backgrounds. This stigma needs to be overcome by promoting the value and legitimacy of APEL qualifications. APEL candidates require additional support and resources to prepare for the assessment process, including guidance on compiling evidence of their experiential learning and access to preparatory courses or materials. To ensure that APEL is accessible to individuals from diverse socio-economic backgrounds and marginalized communities, equality in education is critical. Advantages in cost, language proficiency, and geographic location can make APEL more inclusive. Collaboration between educational institutions, employers, policymakers, and stakeholders is vital to enhance the recognition, effectiveness, and accessibility of APEL in Malaysia's education system (Leong 2023a).

3. Importance of Recognizing Prior Experiential Learning in the Context of Lifelong Learning and Skills Development

Recognizing prior experiential learning is critical in the context of lifelong learning and skills development. Many individuals acquire valuable knowledge, skills, and competencies through informal learning experiences, such as work, volunteer activities, or hobbies (Leong 2023b, Leong 2023c). Recognizing and accrediting these experiences allow for diverse pathways to learning and validate individuals' capabilities beyond formal education. Accrediting prior learning experiences enhances individuals' employability by providing formal recognition of their skills and competencies to prospective employers. This is particularly important in a rapidly changing labor market where employers increasingly value practical skills and hands-on experience. Prior experiential learning enables individuals to engage in continuous learning and skill development throughout their lives (Kumar 2023a, Leong 2023d). It reinforces the idea that learning is a lifelong process and empowers individuals to take their learning paths. Through prior learning experiences, individuals can avoid redundant learning by exempting them from repeating courses or modules they have already mastered (Leong 2023e, Kunar 2023b). This not only saves time and resources but also allows individuals to



acquire new knowledge and skills that are relevant to their personal and professional goals. Prior experiential learning promotes inclusion and equality by providing alternative pathways to education and training for individuals who have difficulty in joining formal education settings. Learning opportunities must be accessible and equitable for all, regardless of background or circumstances. The APEL Programme recognizes and accredits individuals' prior experiential learning, thereby promoting lifelong learning, enhancing employability, and fostering inclusive and equitable education systems. By acknowledging the diverse pathways to learning and valuing individuals' existing knowledge and skills, the APEL Programme contributes to raising a more skilled, knowledgeable, and resilient workforce for the future.

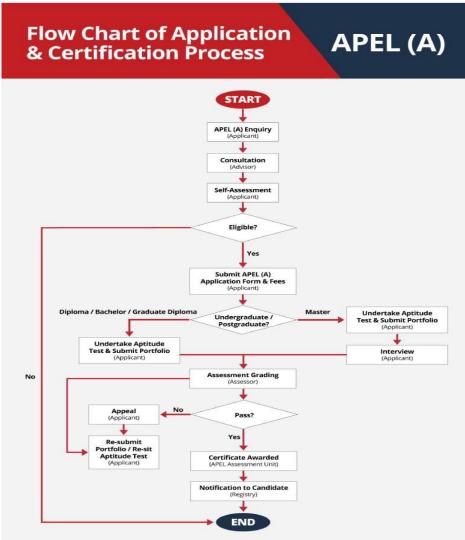


Fig 2. The flow chart and application and certification process of APEL A.

4. Evolution of APEL Programme

The APEL Programme has its roots in the country's commitment to enhancing access to education and promoting lifelong learning. The development of the APEL Programme traces back to the following key milestones and policy initiatives.

- Establishment of MQA: MQA was established in 2007 as a statutory body under the Ministry of Higher Education (MQA 2022, MHE 2013). One of its key functions is to oversee the accreditation and quality assurance of higher education qualifications in Malaysia.
- Incorporation of Recognition of Prior Learning (RPL): The concept of RPL, which forms the basis of the APEL Programme, was incorporated into MQF (MOE 2012, MHE 2015, MOE 2017). RPL recognizes individuals' prior



- learning experiences, regardless of where or how they were acquired, and provides pathways for the formal recognition and accreditation of these experiences.
- Development of APEL Guidelines and Procedures: MQA, in collaboration with relevant stakeholders, developed guidelines and procedures for the implementation of the APEL Programme (MOE 2017, MQA 2020). These guidelines outline the eligibility criteria, assessment processes, and accreditation standards for recognizing prior experiential learning.
- Pilot Implementation and Evaluation: The APEL Programme was tested in selecting higher education institutions and training providers for its feasibility, effectiveness, and impact. The pilot implementation involved assessing the readiness of institutions, training assessors, and evaluating the accreditation process.
- Expansion and Scaling-up: Following the successful pilot phase, the APEL Programme was gradually expanded and scaled up to include a wider range of qualifications and institutions (MQA 2022). Efforts were made to raise awareness among educational institutions, employers, and the general public about the benefits and opportunities offered by APEL.
- Integration with National Development Plans: The APEL Programme was integrated into Malaysia's national development plans and policies, including the Malaysia Education Blueprint and the National Skills Development Blueprint (MQA 2018). These plans emphasize the importance of lifelong learning, skills recognition, and workforce development in driving Malaysia's socio-economic growth and competitiveness.
- Continuous Improvement and Quality Assurance: MQA regularly reviews and updates the APEL guidelines, procedures, and accreditation standards to ensure their relevance, effectiveness, and alignment with national and international best practices (MHE 2013). Continuous improvement efforts focus on enhancing the quality, transparency, and credibility of the APEL Programme.
- Key Milestones, Policies, and Initiatives Driving the Implementation of APEL.
- 1. 2007: Establishment of MQA to oversee the accreditation and quality assurance of higher education qualifications, including the development of APEL guidelines and procedures (MOE 2012).
- 2. 2011: Introduction of the APEL Programme pilot phase in selected higher education institutions and training providers to test its feasibility and effectiveness.
- 3. 2013: Expansion and scaling up of the APEL Programme to include a wider range of qualifications and institutions to raise awareness and build capacity among stakeholders.
- 4. 2015: Integration of the APEL Programme into Malaysia's national development plans and policies, emphasizing the importance of lifelong learning, skills recognition, and workforce development.
- 5. 2017: Review and update of APEL guidelines, procedures, and accreditation standards by the MQA to ensure their relevance, effectiveness, and alignment with national and international standards.
- 6. 2020: Continued efforts to promote the APEL Programme and enhance its accessibility, inclusivity, and quality assurance mechanisms, in line with Malaysia's vision for sustainable development and human capital development.

The historical background and development of the APEL Programme in Malaysia reflect the country's commitment to promoting lifelong learning, skills recognition, and inclusive education systems that empower individuals to pursue their educational and career aspirations as shown in Fig. 3. Through continuous improvement and collaboration with stakeholders, Malaysia aims to further enhance the effectiveness and impact of the APEL Programme in driving socio-economic development and building a skilled and knowledgeable workforce for the future.



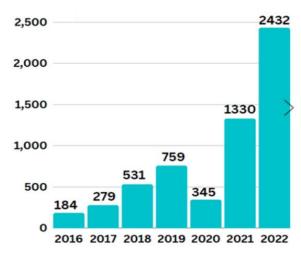


Fig.3. Number of students applying for APEL C from year 2016 to 2022.

5. Benefits of APEL

The APEL Programme has provided numerous benefits to individuals by offering opportunities for skills recognition, academic advancement, and career progression. APEL recognizes and accredits prior experiential learning. Many individuals acquire valuable skills, knowledge, and competencies through work experience, volunteer activities, or informal learning settings. APEL allows these individuals to showcase and validate their skills, providing official recognition for their achievements (Fig. 4). By recognizing prior experiential learning, APEL empowers individuals to leverage their existing competencies and talents, enhancing their confidence and sense of accomplishment. APEL opens doors for individuals to pursue further education and training opportunities. Through APEL, individuals can gain entry into higher education programs, obtain credit exemptions, or advance to higher levels of study based on their prior learning experiences. This flexibility in academic pathways allows individuals to have their existing knowledge and skills, pursue new academic interests, and achieve their educational goals more efficiently (Kumar 2023b, Choo 2018, Leong 2019). APEL plays a crucial role in facilitating career advancement and professional development. Individuals who undergo APEL assessment and accreditation may receive qualifications or certifications that enhance their employability and career prospects. Employers value candidates with recognized prior experiential learning, as it demonstrates the individual's ability to apply theoretical knowledge and adapt to diverse work environments. APEL graduates can also be eligible for promotions, salary increases, or job opportunities that require specific qualifications or certifications. Beyond skills recognition, academic advancement, and career progression, APEL contributes to individuals' personal growth and development. The APEL process encourages selfreflection, critical thinking, and lifelong learning, fostering a mindset of continuous improvement and self-directed learning. Individuals who undergo APEL assessment gain a deeper appreciation for their learning paths and accomplishments, increasing self-awareness, motivation, and resilience.

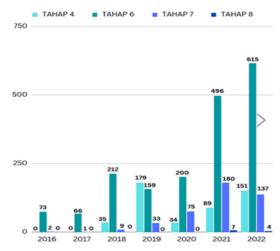


Fig 4. Number of students passing APEL C from year 2016 to 2022 based on various levels (Tahap MQF).



6. Implications for Educational Institutions

Educational institutions are implementing the APEL Programme for the recognition of prior learning as shown in Fig. 5. They are responsible for implementing APEL policies and guidelines set by MQA and other relevant authorities as highlighted in Table 2. They need to ensure that APEL processes align with institutional policies, academic standards, and quality assurance measures to maintain consistency and credibility. They also need to actively promote APEL among students, faculty, staff, and prospective learners to raise awareness about the program's benefits and opportunities by educating stakeholders about the APEL process, eligibility criteria, and pathways for recognition of prior learning through information sessions, workshops, and outreach activities.

The institutions need to provide advisory and support services to individuals interested in pursuing APEL accreditation, guiding them through the application process, documentation requirements, and assessment procedures. They can offer counseling, mentoring, and academic advising to help applicants prepare their portfolios, articulate their learning outcomes, and navigate the APEL assessment process effectively. Trained assessors and evaluators need to be employed to assess individuals' prior learning experiences and determine their eligibility for credit transfer, exemptions, or direct entry into higher education programs. They need to establish rigorous assessment criteria, evaluation methods, and quality assurance mechanisms to ensure the validity, reliability, and fairness of APEL assessments. For curriculum alignment and credit transfer, the institutions must fulfill APEL requirements to recognize prior learning and seamlessly integrate APEL-accredited qualifications. They need credit transfer policies and procedures to award academic credits or exemptions to individuals based on their accredited prior learning experiences, allowing them to progress through their studies more efficiently. For continuous improvement and professional development, continuous improvement efforts are necessary to enhance the effectiveness, efficiency, and quality of APEL implementation. The institutions need to invest in staff training, professional development, and capacity-building initiatives to ensure that assessors, advisors, and administrators are equipped with the knowledge, skills, and competencies needed to support APEL applicants and uphold the integrity of the program. Research and innovation initiatives are demanded to explore best practices, emerging trends, and innovative approaches in recognizing and accrediting prior learning. Collaborating with other institutions, government agencies, and industry partners, the institutions must share knowledge, exchange experiences, and contribute to the advancement of APEL policies, methodologies, and technologies (Wang 2010, Huang 2008, Leong 2024b). Educational institutions play a multifaceted role in implementing the APEL Programme and facilitating the recognition of prior learning. Through their commitment to promoting APEL, they contribute to expanding access to education, promoting lifelong learning, and empowering individuals to realize their educational and career aspirations based on their diverse learning experiences.

Table 2. Comparison of APEL (A) and APEL (C).

ITEM	APEL (A)	APEL (C)
Purpose	Recognize the learning regardless of how and where it was acquired for access to a program	Recognize the learning regardless of how and where it was acquired for course credit award in an academic program pursued
Appointment of HEPs	HEPs are not required to apply for approval to accept APEL(A) students.	HEPs are required to apply for MQA approval to conduct APEL(C) Pilot HEPs: OUM, WOU, UiTM INTI International University
Fees Paid by Students	FEES charged to students for APEL(A) assessment are stipulated by MQA: 1. Certificate/Diploma: RM155 2. Bachelor's Degree: RM250 3. Master's Degree: RM370	Fees for assessment charged to students for APEL(C) are stipulated by HEPs.
Application for APEL Assessment	Candidates are required to submit the application for APEL(A) certification to MQA or APEL Assessment Centre	Students are required to submit the application for APEL(C) assessment to the HEPs
Assessment Instrument	Assessment Instrument of APEL(A) is standardized and administered nationwide.	Assessment Instrument of APEL(C) of the HEPs are varied depending on the nature of the course and students'/HEPs preference
Period of Appointment/ Approval	OPEN-ENDED	5 years



	Only applicable to Malaysian Pass the Aptitude Test and Portfolio	
Basic Requirements	Minimum age requirements: Certificate -19 years of age Diploma - 20 years of age Bachelor's Degree – 21 years of age Master's Degree –30 years of age Doctoral Degree –35 years of age	Open to all Pass APEL(C) assessment No minimum agerequirements
Administrator of Assessment	Coordination & Quality Assurance Reference Division	Standards Division

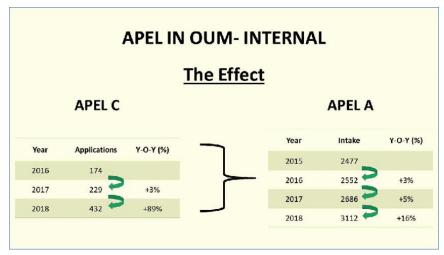


Fig. 5. OUM -APEL Acceptance, 2016–2018.

7. Employers' Perceptions and Attitudes Toward APEL Graduates

As APEL recognizes individuals' prior learning experiences and provides formal accreditation for their skills and competencies, employers' perceptions and attitudes towards APEL graduates and qualifications are essential for the program's effectiveness in meeting industry needs and enhancing graduates' employability.

Employers generally value practical experience and hands-on skills acquired through work, internships, or volunteer experiences. APEL graduates, who are assessed and accredited for their prior experiential learning, possess relevant skills and competencies that align with industry demands. Employers may view APEL qualifications as evidence of candidates' ability to apply theoretical knowledge in real-world contexts and adapt to diverse work environments, enhancing their attractiveness as potential employees. APEL offers an alternative pathway for individuals to obtain formal qualifications based on their diverse learning experiences, including work, life, and informal learning settings. Employers who recognize and value non-traditional learning pathways view APEL qualifications positively, appreciating candidates' initiative, motivation, and commitment to lifelong learning. Employers perceive APEL graduates as self-directed learners who have demonstrated resilience, adaptability, and a willingness to invest in their personal and professional development, qualities that are highly valued in today's dynamic and competitive job market. Employers' perceptions of APEL qualifications depend on the relevance and applicability of the skills and knowledge acquired through prior experiential learning to specific industries or roles in workplaces. Industries with rapidly evolving technologies or changing skill requirements particularly value APEL graduates who possess up-to-date, industry-relevant competencies that can contribute to organizational innovation, productivity, and competitiveness. Employers' perceptions of APEL qualifications are influenced by their trust and confidence in the accreditation process, assessment standards, and quality assurance mechanisms implemented by educational institutions and relevant authorities. Employers may prefer APEL qualifications that are awarded by reputable institutions and accredited by recognized accrediting bodies, as they assure quality and credibility. Employers' perceptions may vary depending on their level of awareness and understanding of the program, its objectives, and its benefits. Employers who are familiar with APEL and its processes may be more likely to recognize and appreciate the value of APEL qualifications, while those who are less informed may require additional information and education to fully understand the program's potential contributions to workforce development and talent acquisition. Employers' perceptions and attitudes towards APEL graduates and



qualifications play a crucial role in the program's impact on graduates' employability and career prospects. By recognizing the value of practical experience, appreciating non-traditional learning pathways, and emphasizing relevance to industry needs, employers can contribute to the recognition and acceptance of APEL qualifications as valuable credentials that enhance the skills, knowledge, and competencies of the workforce. Continued efforts to raise awareness, build trust, and foster collaboration between educational institutions and employers are essential for maximizing the benefits of APEL and promoting lifelong learning and skills development in the workforce.

8. Challenges in Implementation

The APEL Programme is valuable but faces several challenges in its implementation and uptake. These challenges can affect the program's effectiveness in recognizing individuals' prior learning experiences and promoting lifelong learning (Leong 2024c, Leong 2024d).

There is a lack of awareness among individuals, educational institutions, employers, and the general public about the APEL Programme and its benefits. The APEL process, eligibility criteria, and pathways for recognition of prior learning are underestimated, leading to misconceptions and underutilization. Unequal access to APEL opportunities may occur due to socioeconomic disparities, geographic location, or educational background. The limited availability of APEL assessment centers, support services, and resources in rural or remote areas also makes it difficult for individuals to access the program. Quality assurance and standards are demanded due to the variability in the quality and rigor of APEL assessment processes, evaluation criteria, and accreditation standards in different educational institutions and assessment centers. Consistency in the interpretation and application of APEL guidelines and procedures is vital to omit discrepancies in outcomes and perceptions of fairness. There is a challenge in gathering and documenting prior learning experiences, particularly for individuals with limited formal documentation or credentials. It may be difficult to articulate and present experiential learning outcomes in a manner that aligns with APEL assessment criteria and expectations. This may cause assessment bias and subjectivity, particularly when evaluating non-traditional learning experiences or competencies that may not align with traditional academic standards. Thus, a diversity of assessors and evaluators is needed to allow for perspectives and judgments during the assessment process. Insufficient funding, staffing, and infrastructure support for educational institutions and assessment centers may prohibit effective the implementation and administration of the APEL Programme. Limited capacity for training assessors, advisors, and administrators must be solved to ensure competence, professionalism, and consistency in APEL processes. It is not easy to gain recognition and acceptance of APEL qualifications by employers, professional bodies, and other stakeholders in the labor market. Perceptions of APEL qualifications as too less credible or valuable compared to traditional academic credentials to employ APEL graduates. Thus, it is necessary to integrate APEL with existing systems. However, it may be difficult to integrate APEL processes and outcomes with existing educational systems, curricula, and credit transfer mechanisms due to resistance to the change in traditional assessment and qualification.

Addressing these challenges requires collaborative efforts from policymakers, educational institutions, employers, and relevant stakeholders to enhance awareness, accessibility, quality assurance, and recognition of APEL qualifications. Strategies are demanded including targeted outreach and communication campaigns, capacity-building initiatives, standardization of assessment practices, and stakeholder engagement to promote understanding and acceptance of APEL as a valuable pathway to lifelong learning and skills recognition.

9. Effectiveness of APEL in Life-long Learning

To enhance the effectiveness of APEL in lifelong learning, the awareness and recognition of the value of APEL are vital in recognizing and accrediting prior experiential learning. Success stories of individuals who have benefited from APEL can demonstrate its effectiveness. A standardized assessment process and procedure is necessary to evaluate experiential learning in different fields and disciplines. Transparency, consistency, and fairness are vital in the assessment process to maintain the integrity of APEL qualifications. Then, guidance, counseling, and support services must be offered to APEL candidates throughout the assessment process to provide resources, workshops, and preparatory courses to help candidates compile evidence of their experiential learning and prepare for assessments. Flexibility is inevitable in learning pathways to accommodate the diverse needs and backgrounds of lifelong learners to offer multiple entry points, recognition of informal learning, and credit transfer options to facilitate continuous learning and skill development. APEL in formal education systems provides opportunities for lifelong learners to further their education and career advancement and establish pathways to access higher education programs and professional certifications. A quality assurance mechanism needs to be constructed to ensure the credibility and reliability of APEL assessments and qualifications. By regularly reviewing and updating, the assessment criteria and processes can be aligned with evolving industry



standards and educational practices. Through collaboration and partnerships between educational institutions, employers, industry associations, and government agencies, the development and recognition of APEL are enhanced. It is necessary to involve stakeholders in the design, implementation, and evaluation of APEL programs to ensure relevance and effectiveness.

By implementing these strategies, APEL can become a more effective tool for lifelong learning, enabling individuals to leverage their prior experiential learning to pursue further education, career advancement, and personal development throughout their lives.

10. Conclusions

The APEL Programme in Malaysia has impacted individuals, educational institutions, and the workforce. Through APEL, individuals have their prior learning experiences recognized and accredited, leading to academic qualifications and enhanced career opportunities. The program has facilitated access to higher education in non-traditional learning pathways for adult learners, working professionals, and individuals from marginalized communities. APEL has also contributed to the promotion of lifelong learning and skills development by valuing diverse learning experiences beyond formal education. Educational institutions play a crucial role in implementing APEL and ensuring the quality and integrity of the accreditation process. Challenges such as awareness, accessibility, and quality assurance issues exist but efforts are being made to address them through collaborative initiatives and continuous improvement. Overall, the APEL Programme has made significant strides in recognizing and validating individuals' prior experiential learning, empowering them to pursue their educational and career aspirations, and contributing to the development of a skilled and knowledgeable workforce in Malaysia.

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References

- 1. Malaysian Qualifications Agency (MQA). (2022). About Us. Available Online: https://www.mqa.gov.my/ (accessed on February 28, 2024)
- Malaysian Qualifications Agency (MQA). (2018). Malaysian Qualifications Framework: Guidelines for Accreditation of Prior Experiential
 Learning (APEL). Available Online: https://www.mqa.gov.my/penerbitan/Pages/Accreditation-of-Prior-Experiential-Learning(APEL).aspx (accessed on February 28, 2024)
- 3. Ministry of Higher Education Malaysia (MHE). (2013). APEL Handbook: Guidelines and Procedures. Available Online: https://www.mqa.gov.my/penerbitan/Pages/Accreditation-of-Prior-Experiential-Learning-(APEL).aspx (accessed on February 28, 2024)
- 4. Ministry of Education Malaysia (MOE). (2012). Pilot Implementation of APEL: Final Report. Available Online: https://www.moe.gov.my/muat-turun/lain-lain/konsep/penerbitan/3674-penerbitan-akreditasi-pembelajaran-terdahulu-berasaskan-pengalaman (accessed on February 28, 2024)
- 5. Ministry of Higher Education Malaysia (MHE). (2015). APEL Implementation Plan: Scaling Up Phase. Available Online: https://www.moe.gov.my/muat-turun/lain-lain/konsep/penerbitan/4169-apel-implementation-plan-scaling-up-phase (accessed on February 28, 2024)
- 6. Ministry of Education Malaysia (MOE). (2017). Malaysia Education Blueprint 2015–2025. Available Online: https://www.moe.gov.my/en/maklumat-lain/pelan-pembangunan-pendidikan-malaysia (accessed on February 28, 2024)
- Malaysian Qualifications Agency (MQA). (2020). Annual Report. Available Online: https://www.mqa.gov.my/penerbitan/Pages/Annual-Report.aspx (accessed on February 28, 2024)
- 8. Noraini, K., Wahid, R., & Wan, A. (2015). Implementation framework system for accreditation of prior experiential learning (APEL) in higher institutions in Malaysia. *Journal Teknologi*. 77, 145–150.



- 9. Malaysian Qualifications Agency (MQA). (2023). Guideline to Good Practices: Accreditation of Prior Experiential Learning for Access (APEL.A) and Accreditation of Prior Experiential Learning for Micro-credentials (APEL.M). Available Online: https://www2.mqa.gov.my/qad/v2/document/2022/GGP/Draf%20GGP%20APELA%2019May22(ndV3).pdf (accessed on February 28, 2024)
- 10. Ooi, L.H., & Din Eak, A. (2019). Implementation and challenges of accreditation of prior experiential learning: Admissions (APEL-A):

 The assessors' perspective. *Asian Association of Open Universities Journal*. 14, 1–11.
- 11. Leong, W.Y., Leong, Y.Z., & Leong, W.S. (2024a). *The Impact of the Accreditation of Prior Experiential Learning (APEL). Programme in Malaysia*, In Proceedings of 2024 IEEE 7th Eurasian Conference on Educational Innovation (IEEE ECEI 2024), Bangkok, Thailand. January 26–28, 2024.
- 12. Leong, W.Y. (2022). Human Machine Collaboration and Interaction for Smart Manufacturing: Automation, Robotics, Sensing, Artificial Intelligence, 5G, IoTs and Blockchain. London, UK: The Institution of Engineering and Technology.
- 13. Leong, W.Y. (2023a). *Digital Technology for Asean Energy*, In Proceedings of 2023 International Conference on Circuit Power and Computing Technologies (ICCPCT), Kollam, India, August 10–11, 2023. pp. 1480–1486. http://doi. 10.1109/ICCPCT58313.2023.10244806.
- 14. Leong, W.Y., Leong, Y.Z., & Leong, W. S.(2023b). *Human-Machine Interaction in Biomedical Manufacturing*, In Proceedings of 2023 IEEE 5th Eurasia Conference on IOT, Communication and Engineering (ECICE), Yunlin, Taiwan, October 23–29, 2023. pp. 939–944.
- 15. Leong, W.Y., Leong, Y.Z., & Leong, W.S. (2023c). Smart Manufacturing Technology for Environmental, Social, and Governance (ESG) Sustainability. In Proceedings of 2023 IEEE 5th Eurasia Conference on IOT, Communication and Engineering (ECICE), Yunlin, Taiwan, 27–29 October 2023, pp. 1–6, doi: 10.1109/ECICE59523.2023.10383150.
- 16. Kumar, R., Jain, V., Leong, W.Y. & Teyarachakul, S. (2023a). Convergence of IoT, Blockchain, and Computational Intelligence in Smart Cities, CRC Press: Boca Raton, Florida, United States.
- 17. Leong, W.Y., Heng, L.S., & Leong, Y.Z. (2023d). *Smart city initiatives in Malaysia and Southeast Asia*. In Proceedings of 12th International Conference on Renewable Power Generation (RPG 2023), October 14-15, 2023, Shanghai, China. pp. 1143 1149,
- 18. Leong, W.Y., Heng, L. S., & Leong, Y. Z. (2023e). *Malaysia renewable energy policy and its impact on regional countries*. In Proceedings of 12th International Conference on Renewable Power Generation (RPG 2023), Shanghai, China, October 14–15, 2023. pp. 7–13. http://doi. 10.1049/icp.2023.2114.
- 19. Kumar, R., Kapil, A. K., Athavale, V., Leong, W.Y., & Touzene, A. (2023b). The catalyst for clean and green energy using blockchain technology. In *Modeling for Sustainable Development: A Multidisciplinary Approach*. New York, United States: Nova Science Publishers, Inc. pp. 23–39.
- 20. Choo, K.W., Zakaria, R., Adnan, A., & Leong, W.Y. (2018). Various Techniques on Retrofitting for Earthquake Hazard Mitigation.

 International Journal of Engineering & Technology. 7, 167. http://doi.10.14419/ijet.v7i3.36.29101.
- Leong, W.Y. (2019). EEG signal processing: feature extraction, selection and classification methods. London, UK: The Institution of Engineering and Technology.
- 22. Wang, X.F., Chong, P. H. J., and Leong, W.Y. (2010). *Performance comparison of CSMA/CD, CSMA/CA, CSMA/RI, CSMA/PRI and CSMA/PR with BEB*, In Proceedings of 2010 5th IEEE Conference on Industrial Electronics and Applications, Taichung, Taiwan, June 15–17, 2010. pp. 1843–1848, doi: 10.1109/ICIEA.2010.5515401.
- 23. Huang, S., Zhang, D.H., Chan, H.L., et al. (2008). *Detecting tool breakage using accelerometer in ball-nose end milling*, In Proceedings of 2008 10th International Conference on Control, Automation, Robotics and Vision. Hanoi, Vietnam, December 17–20, 2008. pp. 927–933, doi: 10.1109/ICARCV.2008.4795642.



- 24. Leong, W.Y., Leong, Y.Z., & Leong, W.S. (2024b). *Integrating SDGs Education into a Design Thinking Module*, In Proceedings of 2024 IEEE 7th Eurasian Conference on Educational Innovation (IEEE ECEI 2024), 26–28 January 2024, Bangkok, Thailand.
- 25. Leong, W.Y., Zhang, J.B., (2024c). Failure Analysis for Project-Based Learning (PBL) in Engineering, ASM Science Journal, 19, 1–12. https://doi.org/10.32802/asmscj.2023.1598.
- 26. Leong, W.Y., Leong, Y.Z., & Leong, W.S. (2024d). Engaging SDGs Agenda into a Design Thinking Module. Educational Innovations and Emerging Technologies, 4(2), 1-7. https://doi.org/10.35745/eiet2024v04.02.0001

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