Available Online at www.e-iph.co.uk
Indexed in Clarivate Analytics WoS, and ScienceOPEN

E-B Environment - Behaviour Proceedings Journal

KICSS2024

Kedah International Conference on Social Sciences:
https://kicss2024.wixsite.com/kicss2024

e-IPH e-International Publishing House Ltd., United Kingdom

BizFame 2024: 3rd International Conference on Business Finance Management & Economics
Suan Sunandha Rajabhat University, Bangkok, Thailand, 24 & 25 October 2024

Organised by: Universiti Teknologi MARA, Kedah, Malaysia

Managing Sustainable Development Goal 12 by University Students in Malaysia

Mohd Rizaimy Shaharudin[1*], Natpatsaya Setthachotsombut[2], Lamphai Trakoonsanti[2], Siti Norida Wahab[3]
**Corresponding Author*

[1] Faculty of Business and Management, Universiti Teknologi MARA, Kedah Branch, 08400 Merbok, Kedah, Malaysia
[2] College of Logistics and Supply Chain, Suan Sunandha Rajabhat University, Nakhon Pathom, Thailand
[3] Faculty of Business and Management, Universiti Teknologi MARA, 40450 Shah Alam, Selangor, Malaysia

rizaimy@uitm.edu.my, lamphai.tr@ssru.ac.th., natpatsaya.se@ssru.ac.th., sitinorida23@uitm.edu.my.
Tel: +604-4562090

Abstract
This study aims to identify key factors contributing to the success of Sustainable Development Goal 12 (SDG12) projects, specifically focusing on responsible consumption and production undertaken by students from Malaysian universities. Using a quantitative survey approach, the findings reveal that university support and student engagement significantly influence the SDG12 project's success. The study highlights the crucial role of institutional support in fostering student engagement, which enhances students' SDG12 project success. By promoting student engagement through university support, institutions advance their sustainability objectives and cultivate a generation of advocates capable of driving future change.

Keywords: SDG; Goal 12; Student; Higher Education; Institutional

DOI

1.0 Introduction

The role of university students in promoting sustainability, particularly in the context of Sustainable Development Goal 12 (SDG12), is increasingly recognized as vital for fostering responsible consumption and production practices. In Malaysia, research indicates that students from leading universities actively engage in sustainability initiatives that align with SDG12, demonstrating a commitment to sustainability that significantly impacts campus operations, local communities, and policy advocacy (Hassan & Noor, 2017). These students participate in various activities, projects, and strategies that enhance their educational experience and contribute to broader societal goals of sustainability (Albareda-Tiana et al., 2018).

Higher education institutions are pivotal in shaping societal norms regarding sustainability. By prioritizing sustainability, universities can influence their internal practices and extend their impact to the surrounding community. This influence is particularly evident in sustainability reporting, which enhances transparency and accountability in sustainability performance. Transparent reporting practices enable universities to drive improvements in their sustainability initiatives, fostering a culture of responsibility among students and faculty (Tassone et al., 2017). Several studies have identified key factors influencing social sustainability, including diversity practices and safety and health practices, as noted by Shaharudin et al. (2022a). Such practices encourage students to engage in sustainability efforts, reinforcing their role as change agents within their institutions (Rahmawati et al., 2022). Hence, the study's objective is to examine the key factors contributing to the successful implementation of SDG 12 projects by students from Malaysian universities.

Despite students' positive engagement, several challenges hinder their participation in sustainability projects. Many universities prioritize research and academic performance over extracurricular activities, including sustainability initiatives, leading to limited funding and insufficient student mentorship opportunities (Hassan & Noor, 2017). This lack of support can result in students feeling undervalued and demotivated, which stifles their long-term engagement in sustainability projects (Tassone et al., 2017). Furthermore, the absence

of recognition for student-led initiatives diminishes the perceived importance of these projects within the university context, further complicating students' efforts to promote sustainability (Rahmawati et al., 2022). Concerning this, the role of university policies and institutional support in facilitating or hindering student-led SDG12 projects is not well-documented. Research is needed to identify how institutional frameworks can better support these initiatives (Zhao & Cheah, 2023).

To overcome these challenges, universities must provide adequate resources, mentorship, and administrative support to empower students in their sustainability efforts. Such support can facilitate the navigation of complexities associated with launching and sustaining sustainability projects (Herranen et al., 2020). Collaborative environments that bring together students, faculty, and external partners can enhance the effectiveness of sustainability initiatives, serving as platforms for sharing knowledge, resources, and best practices (Rahmawati et al., 2022). This collaborative approach is essential for fostering a sense of ownership among students, ensuring the longevity and impact of their initiatives (Hanafiah & Jansar, 2019). Cultural and institutional differences also significantly shape the sustainability landscape across Asian universities. For instance, in Japan, student-led initiatives often integrate traditional knowledge with modern sustainability practices, such as sustainable agriculture that combines ancient farming techniques with contemporary technology (Tassone et al., 2017). This contextualization of sustainability within local cultures fosters a deeper connection between students and their projects, enhancing the relevance and effectiveness of sustainability initiatives. By recognizing and leveraging local cultural contexts, universities can better engage students and promote successful sustainability outcomes.

The findings of this study can contribute to a deeper understanding of the role of students in sustainability efforts and inform strategies for enhancing their engagement and impact. University students can play a crucial role in promoting sustainability aligned with SDG12. Their engagement in sustainability initiatives is vital for fostering responsible consumption and production practices. Internal and external constraints, such as a lack of institutional support and communication networks, hinder proactive student sustainability performance (Kieu & Singer, 2020). However, to maximize their impact, universities must address the challenges faced by students and provide the necessary support and resources. By fostering collaborative environments and recognizing the importance of cultural contexts, universities can empower students to lead impactful sustainability initiatives that benefit both their institutions and the broader community.

2.0 Literature Review

2.1 SDG12: Responsible Consumption and Production Project in the University

The implementation of SDG12 in universities emphasizes efficient resource use, waste reduction, and sustainable practices, which can significantly reduce environmental footprints and enhance student awareness and innovation in sustainability technologies (Shaharudin et al., 2022b). Universities have the potential to model and promote these practices through educational and operational activities. Student-led initiatives have emerged as a powerful force in achieving SDG12, with universities worldwide witnessing substantial student contributions in areas such as zero-waste campaigns, energy conservation, and sustainable food programs (Johnson et al., 2019). For example, in Europe, universities have integrated sustainability into their core operations, demonstrating how students can influence institutional practices and contribute to broader societal change (Johnson et al., 2019). In Asia, particularly Japan, student-led initiatives often focus on integrating traditional knowledge with modern sustainability practices, such as promoting sustainable agriculture that combines ancient farming techniques with contemporary technology (Khurshid et al., 2020).

Meanwhile, universities in the United States leverage technology to facilitate student-led sustainability efforts, utilizing apps and digital platforms to monitor and reduce carbon footprints, which empowers students to advocate for policy changes at the university level. Overall, the active involvement of students in sustainability initiatives not only fosters a culture of responsibility but also prepares them to be future leaders in sustainable practices. Malaysian universities have been actively engaging in sustainability initiatives, but there are unique challenges and opportunities specific to the region, such as sustainability engagement, green practices, audits and waste minimization to promote sustainability on campus (Anthony, 2021). By focusing on these areas, the study contributes to a deeper understanding of how Malaysian universities can enhance their sustainability efforts and align with global practices, ultimately supporting the achievement of SDG12 in the region.

2.2 Higher Education Support for University Sustainable Development

Higher education institutions (HEIs) play a crucial role in promoting sustainable development by serving as hubs for innovation and leadership in sustainability, integrating environmental, social, and economic dimensions into their operations and curricula. Through sustainability reporting, universities enhance transparency and accountability, which can drive improvements in sustainability performance. Research indicates that HEIs prioritizing sustainability in their educational programs significantly influence students' attitudes and behaviors towards sustainability, preparing them to address complex challenges in their future careers (Saleh, 2024). Furthermore, many institutions actively work to reduce their carbon footprints and engage in community outreach initiatives, demonstrating their commitment to sustainability (Sari, 2023). Overall, HEIs are essential in fostering a culture of sustainability and contributing to achieving the United Nations SDGs (Platitsa et al., 2024). Malaysian HEIs actively promote sustainable development through diverse strategies, collaborative networks, and innovative pedagogical approaches. Despite challenges, these efforts contribute significantly to achieving the SDGs and fostering a sustainable future. Nevertheless, there is limited empirical evidence on how specific university support services directly influence various dimensions of student engagement and success in Malaysia. While some studies highlight the importance of support services (Do et al., 2023), there is a need for more detailed investigations into which services are most effective and why. Thus, this study hypothesized:

Hypothesis 1: University support positively influences SDG 12 project success.

2.3 Student Engagement in Sustainability

Student engagement is essential for advancing sustainability in higher education, as evidenced by various studies highlighting the positive impact of student-led initiatives on campus sustainability, community outreach, and policy influence. Engaged students often become lifelong advocates for sustainability, influencing their peers and communities well beyond their university years (Avelar et al., 2021). For instance, Avelar et al. (2021) emphasize that implementing SDGs through outreach aligns with sustainable management education, involving collaboration with various stakeholders. Additionally, Abubakar et al. (2020) note that institutional commitments to sustainability have increased, driven by advocacy from students and community members. According to a study by Shaharudin et al. (2023), Malaysian university students disposed of their portable e-waste for valid reasons and intentions influenced by their beliefs, norms, and perceptions, all of which were shaped by their personal experiences. Overall, fostering student involvement not only enhances educational outcomes but also cultivates a culture of sustainability that extends into broader societal contexts (Barlett, 2011). While students possess knowledge about sustainability, there is a significant gap in their commitment to participating in sustainability initiatives. This discrepancy suggests that awareness alone does not translate into active engagement. This gap needs further exploration to understand the underlying causes and to develop strategies to bridge it. Hence, this leads to the following hypothesis:
Hypothesis 2: Student engagement positively influences SDG 12 project success.

2.4 Development of the Conceptual Model

The study proposes the research framework depicted in Fig. 1. Based on the literature review; it suggests that University Support and Student Engagement influence SDG12 Project Success in Malaysian universities.

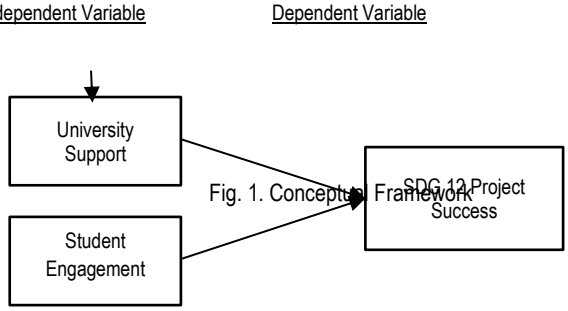

Fig. 1. Conceptual Framework

3.0 Methodology

3.1 Research Design

The study employed a quantitative cross-sectional design, collecting data over four months through a purposive sampling survey to select respondents. This method ensures that the sample is specifically chosen to provide the most relevant and rich information for the study. A total of 170 questionnaires were distributed across five top Malaysian universities known for their advanced SDG12 practices, yielding 114 completed responses for analysis. An optimal sample size balances the need for sufficient power with the efficient use of resources. Data analysis was conducted using Smart-PLS software, while SPSS was utilized for demographic profiling. The demographic characteristics were assessed through frequency distribution analysis (Ali et al., 2012). Smart-PLS software was chosen because of its suitability for small to medium sample sizes and lack of reliance on normally distributed data, making it a flexible choice for empirical research (Aburumman et al., 2023).

3.2 Sample Profile

The majority of respondents were from public universities (98.5%), female students (79.5%), aged 21 to 23 years (80.5%), predominantly Malay (89.7%), enrolled in degree courses (88.7%), and primarily in their second year of university (85.8%).

4.0 Data Analysis

4.1 Assessment of the Measurement Model

In assessing the measurement model, the reflective constructs were evaluated to determine the acceptance of the reliability and validity of the constructs. Table 1 shows that the composite reliability of all of the constructs in the study exceeded the 0.7 threshold, as suggested by Hair et al. (2013).

Table 1. Reliability and Convergent Validity

Construct	No. of Items	Factor Loadings	Composite Reliability	AVE
University Support	4	0.751-0.854	0.871	0.631
Student Engagement	4	0.763-0.835	0.895	0.640
SDG12 Project Success	5	0.701-0.825	0.893	0.587

Moreover, the factor loadings of above 0.6 achieved by all constructs indicated that the reliability of each item was remarkably achieved (Hair et al., 2010). Subsequently, the convergent validity was assessed, and the AVE results of all of the constructs above 0.5 indicated that the convergent validity had reached a satisfactory level (Hair et al., 2013). The discriminant validity was assessed by comparing the square root of the AVE and the inter-correlations with the other model constructs (Fornell & Larcker, 1981). The results in Table 2 revealed that the square root of the AVE for each construct was higher than the inter-correlations between the other constructs. Hence, the results demonstrated adequate discriminant validity with the compliance of adequate convergent validity and discriminant validity. It is evident that the model was sufficient to evaluate its structural model further.

Table 2. Fornell-Larker Criterion Analysis for Discriminant Validity

	1	2	3
University Support	0.831		
Student Engagement	0.527	0.849	
SDG12 Project Success	0.452	0.632	0.812

4.2 Assessment of the Structural Model

The goal of the assessment of the structural model of this study was to investigate the key factors contributing to successful sustainability management through the SDG12 project by students from Malaysian universities. The assessment of the structural model in this study aimed to identify key factors for successful sustainability management in Malaysian universities' SDG12 projects, using predictive relevance measures from Stone (1974), Geisser (1975) and PLS's blindfolding process by Chin (2010). which indicated that all exogenous variables had positive predictive capability values, confirming the model's usefulness and fit.

The subsamples of 5,000 samples were used to simulate testing of smaller sample sizes. The significance level of the path coefficients in the structural model was assessed, with the t-values for a one-tailed t-test being 1.645 (5% of the significance level) and 2.326 (1% of the significance level) (Hair et al., 2010). Based on the summary of the results presented in Table 3, the structural model analysis revealed that University Support significantly influences Student Engagement ($\beta = 0.48$, $p < 0.001$). In addition, Student Engagement strongly and significantly impacts SDG12 Project Success ($\beta = 0.62$, $p < 0.001$). Lastly, University Support directly affects SDG12 Project Success ($\beta = 0.33$, $p < 0.001$), though with a smaller effect size. The R^2 value of 0.30 for Student Engagement suggests that University Support explains 30% of Student Engagement, whereas SDG12 Project Success suggests that Student Engagement explains 52% of the variance in SDG12 Project Success.

Table 3. Path Analysis Result

Hypothesis	Path	Beta	T-statistics	R^2	Decisions
H1	University Support → Student Engagement	0.48	8.10**	0.30	Supported
H2	Student Engagement → SDG12 Project Success	0.62	10.35**	0.52	Supported
H3	University Support → SDG12 Project Success	0.33	5.25**		Supported

5.0 Discussion

The study's findings highlight the intricate relationships between university support, student engagement, and the success of projects aligned with SDG12. The evidence suggests that university support is a critical factor influencing student engagement in sustainability initiatives. This situation aligns with previous research indicating that institutional backing, through mentorship, funding, and infrastructure, is essential for motivating students to participate actively in sustainability efforts. By providing robust support systems, universities can cultivate an environment where students feel empowered and valued, which is crucial for fostering active participation in sustainability projects (Martínez-Acosta et al., 2023).

Moreover, the data reveal that student engagement significantly impacts the success of SDG12 projects. Engaged students contribute innovative ideas and a sense of ownership, which enhances the effectiveness of sustainability initiatives. This finding is consistent with the literature emphasizing the importance of student-led projects in achieving sustainability outcomes. When students are deeply involved, they drive project success and acquire skills and knowledge that extend beyond their academic years, promoting a lifelong commitment to responsible consumption and production (Brugmann et al., 2019). The active involvement of students in sustainability projects is thus not merely beneficial but essential for achieving the goals outlined in SDG12.

Additionally, the study underscores the dual role of university support in directly affecting the success of SDG12 projects. Institutional backing boosts student engagement and enhances the likelihood of project success. This dual effect indicates that universities must prioritize creating an enabling environment for sustainability initiatives by providing necessary resources, facilitating collaborations, and recognizing student-led efforts (Cebrián et al., 2015). Well-supported students are better equipped to navigate the complexities of sustainability projects, which often require interdisciplinary approaches and sustained commitment.

The implications of these findings are significant. They suggest that universities aiming to improve sustainability outcomes should invest in fostering student engagement and providing direct project support. Furthermore, there is a need for further exploration into how specific forms of university support, such as financial resources, mentorship, and collaborative opportunities, contribute to project success. Ultimately, by enhancing student engagement through institutional support, universities advance their sustainability goals and nurture a generation of advocates equipped to drive future change (Aktaş, 2015). Concerning this, the study's findings may serve as a baseline for Asian higher education institutions to take more initiatives toward SDG goals, as they are responsible for educating and training students who will be occupying key positions in industry, government, or education in the coming years.

6.0 Conclusion

University students in Malaysia are pivotal in advancing sustainability efforts, particularly in alignment with SDG12. Despite encountering numerous challenges, their proactive initiatives underscore the transformative potential they hold, not only within campus environments but also in broader societal contexts. When equipped with adequate resources and institutional backing, universities can amplify their impact as catalysts for sustainable consumption and production practices, nurturing a future cohort of sustainability champions. The findings of this study reveal that university support is a decisive factor influencing student engagement and SDG12 project success. Moreover, student engagement emerges as a key driver behind the success of SDG12-related projects. Critically, the study highlights that institutional backing directly shapes the outcomes of these sustainability initiatives, suggesting that a synergistic relationship between academic institutions and student-led actions can lead to meaningful progress toward global sustainability goals.

This study introduces a groundbreaking insight: integrating student-led sustainability initiatives with formal university governance structures can create a self-reinforcing cycle of environmental stewardship. By embedding student voices into institutional decision-making processes, universities enhance project relevance and community buy-in and foster a culture of shared responsibility. This co-creation model presents a transformative approach to sustainability management that bridges academic theory with real-world application, ultimately redefining how SDG12 is pursued in higher education settings. Such an approach offers a scalable, replicable framework that could inspire institutions globally to reimagine their role in advancing sustainable development through empowered youth leadership. The study's limitations include using a cross-sectional design, which cannot establish causality due to the simultaneous measurement of exposure and outcome. Purposive sampling introduces inherent bias, as the sample was not randomly selected, potentially limiting the generalizability of the findings to a broader population.

Additionally, the study focuses on populations from five top Malaysian universities known for their advanced SDG12 practices, which may further restrict the extrapolation of results to other institutions. Finally, while Smart-PLS accommodates non-normal data and small sample sizes, the model's predictive power and robustness could be affected by the limited sample size or omitted variable bias. Further research could explore the long-term impacts of student-led sustainability initiatives, the role of faculty and staff in supporting these efforts, and the specific challenges faced by different types of universities (e.g., public vs. private, large vs. small). Comparative studies between universities in other regions or countries could also provide valuable insights into the factors contributing to successful sustainability efforts.

Acknowledgments

The registration fee is funded by Pembiayaan Yuran Prosiding Berindeks (PYPB), Tabung Dana Kecemerlangan Pendidikan (DKP), Universiti Teknologi MARA (UITM), Malaysia.

References

Abubakar, I., Aina, Y., & Alshuwaikhat, H. (2020). Sustainable development at Saudi Arabian universities: an overview of institutional frameworks. Sustainability, 12(19), 8008.

Aburumman, O. J., Omar, K., Al Shbail, M., & Aldoghan M. (2023). How to Deal with the Results of PLS-SEM? Lecture Notes in Networks and Systems, 495(LNNS), 1196 – 1206

Aktaş, C. B. (2015). Reflections on interdisciplinary sustainability research with undergraduate students. International Journal of Sustainability in Higher Education, 16(3), 354-366.

Albareda-Tiana. S, Vidal-Raméntol S, Pujol-Valls M, Fernández-Morilla M. (2018). Holistic Approaches to Develop Sustainability and Research Competencies in Pre-Service Teacher Training. Sustainability, 10(10), 3698.

Ali, S. M., Shaharudin, M. R. & Anuar, A. (2012). The association between job positions, work experience and career satisfaction: the case of Malaysian's academic staff. Asian Social Science, 8(10), 35-44.

Anthony, J. B. (2021). Green campus paradigms for sustainability attainment in higher education institutions – a comparative study. Journal of Science and Technology Policy Management, 12(1), 117 – 148.

Avelar, A., Silva-Oliveira, K., Farina, M., & Pereira, R. (2021). Contribution of prime in education, research, and outreach in Brazilian higher education institutions. International Journal of Sustainability in Higher Education, 23(2), 283-300.

Barlett, P. (2011). Campus sustainable food projects: critique and engagement. American Anthropologist, 113(1), 101-115.

Brugmann, R., Côté, N., Postma, N., Shaw, E., Pal, D., & Robinson, J. (2019). Expanding student engagement in sustainability: using SDG- and CEL-focused inventories to transform curriculum at the University of Toronto. Sustainability, 11(2), 530.

Cebrián, G., Grace, M., & Humphris, D. (2015). Academic staff engagement in education for sustainable development. Journal of Cleaner Production, 106, 79-86.

Do, T., Okafor, C., Ilyes, E., Alejandro, J., Davenport, S., Gordon, D., Laboy, D., Lor, K., Piper, A., Reed, T., Wang, Y.-C., & Weathers, R. (2023). Building Bridges as We Walk Them: Underrepresented Students' Perspectives on Surviving Inhospitable Institutions. Journal of Higher Education Outreach and Engagement, 27(2), 113 – 126.
Hanafiah, M. and Jansar, K. (2019). Mystream: empowering 21st century skills through transdisciplinary and sustainability techniques. Engineering Heritage Journal, 3(2), 09-12.

Hassan, N., & Noor, M. (2017). Campus sustainability: the need for change. Journal of Bimp-Eaga Regional Development, 3(1), 13-22.

Herranen, J., Tolppanen, S., Vesterinen, V., & Aksela, M. (2020). Challenges and tensions in collaborative planning of a student-led course on sustainability education. Nordic Studies in Science Education, 16(1), 18-36.

Johnson, M., Goldberg, C., Willies-Jacobo, L., Wan, L., Guluma, K, & Smith S. (2019). Implementation and outcomes of a community assessment service-learning activity within academic learning communities. Journal of Medical Education and Curricular Development, 6, 1-10.

Khurshid, F., Ali, S., & Khan, M. (2020). Implementing the Sustainable Development Goals for quality education in institutions of higher education in Pakistan: A qualitative analysis. International Journal of Innovation in Teaching and Learning, 6(1), 1-15.

Kieu, T. K., & Singer, J. (2020). Youth organizations' promotion of education for sustainable development competencies: A case study. European Journal of Sustainable Development Open Access, 9(4), 376 – 394.

Martínez-Acosta, M., Vázquez-Villegas, P., Mejía-Manzano, L., Soto-Inzunza, G., Ruiz-Aguilar, K. M., Kuhn Cuellar, L., Caratozzolo, P. & Membrillo-Hernández, J. (2023). The implementation of sdg12 in and from higher education institutions: universities as laboratories for generating sustainable cities. Frontiers in Sustainable Cities, 5.
Platitsa, V., Sardianou, E., Abeliotis, K. and Mitoula, R. (2024). Perspectives of the administration of Greek universities regarding the adoption of sustainability practices. International Journal of Sustainability in Higher Education, 25(5), 1103-1118.

Rahmawati, Y., Taylor, E., Taylor, P., Ridwan, A., & Mardiah, A. (2022). Students' engagement in education as sustainability: implementing an ethical dilemma-steam teaching model in chemistry learning. Sustainability, 14(6), 3554. https://doi.org/10.3390/su14063554

Saleh, S. (2024). Measuring the impact of higher education in promoting sustainable development goals: analysis of the Arab universities' performance. Problemy Ekorozwoju, 19(1), 261-274.

Sari, R. (2023). The role of universities in realizing sustainability: analysis of ui green metric contributions and publications related to sustainability. E3s Web of Conferences, 450, 01001.

Shaharudin, M.R., Hamid, N. Z. A., Abdullah, D., Ahmad, N., Hassam, S. F., & Fauzi, N. H. H. A. (2022a). Factors Affecting Social Sustainability Performance amongst Malaysian Manufacturing Companies. International Journal of Business and Society, 23(3), 1874-1887.

Shaharudin, M. R., Mohamad Mokhtar, A. R., Wararatchai, P., & Legino, R. (2022b). Circular Supply Chain Management and Circular Economy: A conceptual model. Environment-Behaviour Proceedings Journal, 7(SI7), 31-37.

Shaharudin, M. R., Said, R., Hotrawaisaya, C., Nik Abdul Rashid, N. R., & Azman Perwira, N. F. S. (2020). Linking determinants of the youth's intentions to dispose of portable e-waste with the proper disposal behavior in Malaysia. The Social Science Journal, 60(4), 680–694.

Tassone, V., Dik, G., & Lingen, T. (2017). Empowerment for sustainability in higher education through the eye learning tool. International Journal of Sustainability in Higher Education, 18(3), 341-358.

Zhao S., Cheah K.S.L. (2023). The challenges of Malaysian private universities in reaching sustainable education toward responsible consumption. Cleaner and Responsible Consumption, 10, 100130.