

## **Embedding Sustainability in Landscape Architecture Education: Assessing the Needs of the Malaysian Industry**

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### **ABSTRACT**

This study assesses the need to embed sustainability elements into landscape architecture education in Malaysia, harmonising with industry demands and the Sustainable Development Goals (SDGs). Despite its relatively recent establishment in Malaysia, landscape architecture is experiencing significant growth, necessitating the integration of sustainable development principles into its educational framework. Using the Nominal Group Technique (NGT) to gather insights from seven landscape industry experts, the study identifies a strong consensus on the relevance of sustainability in landscape architecture. The findings indicate a unanimous agreement on the need for graduates to possess sustainability skills, emphasising the integration of Education for Sustainable Development (ESD) introduced by UNESCO. Although the present understanding of ESD among industry personnel is relatively excellent, there is room for development, mainly through greater collaboration between academia and industry. Therefore, this study proposes the revision and enhancement of existing curricula to integrate sustainable aspects relevant to the Malaysian context. The essential need for a comprehensive educational framework is stressed, ensuring that landscape architecture graduates are well-prepared to meet industry expectations and contribute to the SDGs.

**Keywords** Education for sustainable development (ESD); Industry; Landscape architecture; Nominal group techniques; Sustainable development goals

### **INTRODUCTION**

Landscape architecture education has a well-established history in European countries, but it is a relatively new discipline in Asia, including Malaysia. According to Hussein & Kabai (2015), Malaysian landscape education began in 1985 with the introduction of the Landscape Design Diploma program by the Department of Landscape Architecture at Universiti Teknologi Mara, Malaysia (UiTM), lagging 66 years behind European countries. Despite this late start, the profession of landscape architecture is experiencing significant growth in the Asian region.

In Malaysia, landscape architecture education has evolved to meet the specific needs of the industry, catering to the increasing demand for highly skilled professionals. Traditionally, the focus has been on fostering individual creativity and originality (Ruggeri, 2019). Integrating the design process into landscape architecture education allows students to create straightforward yet creative designs since landscape architects must cultivate multidimensional cognitive capacities (Alpak et al., 2021; Duzenli et al., 2017). Furthermore, this profession encompasses everything from site master planning to designing and managing landscapes such as national parks, natural areas, public squares, and functional

gardens that nurture communities and create livable environments (Institute of Landscape Architect Malaysia, 2019).

Although the importance of sustainability is widely recognized, the integration of sustainable elements into landscape architecture education in Malaysia remains limited. Previous studies have only briefly examined the alignment of educational programs with industry needs (Hussein & Kabai, 2015; S.Muthuveeran et al., 2020). This gap raises concerns about the preparedness of graduates to meet the growing demand for sustainable practices in the field. Thus, a needs analysis study is conducted to identify the actual requirements to support curriculum renewal, ensuring alignment with the objectives and needs of stakeholders (Sakumoning & Masnan, 2024; Zahari et al., 2024). This study collaborates with Malaysian industry stakeholders to explore the necessity and methods for embedding sustainability into landscape architecture education, ensuring its relevance to industry expectations.

## **PROBLEM STATEMENT**

Landscape architecture is an environmental discipline that offers structured solutions for addressing complex societal and environmental issues (Zhou, 2020). As a key program in vocational colleges under the Ministry of Education Malaysia (KPM), it is essential in producing skilled and semi-professional workers for the landscape industry (BPLTV, 2023). However, the current landscape architecture education in Malaysia still lags in integrating sustainable practices, focusing more on aesthetic values rather than environmental responsibility (Kempenaar, 2021). This disconnect from industry needs is evident as the landscape industry increasingly recognizes the importance of sustainable practices in development projects.

In Malaysia, environmental sustainability in project development is assessed through tools such as Environmental Impact Assessments (EIA) to reduce environmental issues (Ministry of Natural Resources and Environment Malaysia, 2016). The landscape industry plays a critical role in this process, with the aim of achieving sustainable development. Therefore, TVET graduates in landscape architecture must be equipped with the knowledge, skills, values, and attitudes necessary to meet these industry expectations. In response, the sustainability of the Diploma in Landscape Architecture program is highly dependent on the curriculum. It must align with industry requirements and provide graduates with the competencies necessary for sustainable employment. As noted by (Yunos et al., 2019), curricula should be responsive to changes in the workplace. Thus, the Diploma in Landscape Architecture offered at vocational colleges must rise to the challenge by providing green skills that align with sustainable market demands.

## **MATERIAL AND METHODS**

NGT is a systematic process for determining the consensus among a group of individuals with reference to a particular problem. The NGT was designed by (Delbecq & Van de Ven, 1971) almost four decades ago as a procedure for 'identifying strategic challenges and devising appropriate and innovative plans to tackle them.' The NGT encourages the production of ideas regarding issues, solutions, or both, which are subsequently debated and prioritised in order of priority by individual participants (Gallagher et al., 1993). The NGT encourages equal participation and allows all perspectives to be respectfully considered (Carney et al., 1996), hence reducing strong personalities and concentrating on one position. It has been used in several group settings ever since, including empirical social science research. Researchers that have utilised it in education include O'Neil & Jackson (1983), Lomax & McLeman (1984) and Macphail (2001).

NGT is flexible, allowing its steps to be adapted to the needs of specific studies (Raffi et al., 2025). In this study, NGT is appropriate for identifying the industry's perspectives on embedding sustainability in Malaysian landscape architecture education. Examples of studies that have used NGT include the development of a Design Thinking Teaching Model for primary schools (Nurulrabihah Mat Noh, 2020), the evaluation of a Creative Teaching Model in Islamic Education (Zulkifli et al., 2023) and a scoping review on consensus methods (Humphrey-Murto et al., 2023).

Therefore, this study employs NGT as the primary method, involving seven landscape industry players who gather experts face-to-face. A half-hour session was performed, while a brainstorming session using the NGT method was implemented to gather ideas and solutions based on expert opinion. At the end of the session, the researcher made a specific calculation utilizing the NGT method to produce results that answered the objectives of this study.

### **Sampling**

This study involved the selection of seven experts from the Malaysian landscape industry, a sample size that meets the requirements of the Nominal Group Technique (NGT). According to Horton's (1980) opinion, the NGT sample should be between 7-10 people, which is sufficient. Furthermore, the view expressed by Harvey & Holmes (2012) is that six to twelve experts are sufficient to carry out the NGT procedure. The selection of this small number of experts contributes to more effective communication according to the specific needs of the study.

The participants were chosen based on specific criteria to ensure their expertise and relevance to the study. For academics, the criteria included senior lecturers specializing in landscape architecture or landscape education at higher education institutions. They were also required to serve as academic advisors for the Diploma in Landscape Architecture program at vocational colleges or be members of the Malaysian Qualifications Agency (MQA) evaluation panel for the same program. Additionally, academics with more than 10 years of experience in landscape architecture education were prioritized to ensure comprehensive insights.

For industry players, the selection criteria included representatives from local authorities, practicing landscape architects from consultancy or contractor backgrounds, or employers of graduates from the Diploma in Landscape Architecture program at vocational colleges. Participants were also required to have more than 10 years of experience in the landscape architecture field, ensuring their input was grounded in extensive professional practice. Professional associations were represented by council members of the Institute of Landscape Architects Malaysia (ILAM). These individuals were selected to provide insights into professional standards and the evolving needs of the industry, particularly regarding the integration of sustainability into education. This selection ensured a balanced representation of academic, industry, and professional perspectives, providing comprehensive insights into integrating sustainability into landscape architecture education.

### **NGT Techniques Step**

The Nominal Group Technique (NGT) is a structured process designed to facilitate group consensus. This method, as outlined by Fox (1989) and further validated in recent studies by Mustapha et al. (2022), consists of four distinct phases.

1. Independent Idea Generation  
Each participant independently generates ideas in response to a specific stimulus question. This phase encourages creativity and ensures that initial ideas are not influenced by group dynamics or dominant voices. In this study, the stimulus question focused on identifying the needs for integrating sustainability into landscape architecture education.
2. Round-Robin Sharing  
Participants share their ideas in a round-robin format, where everyone contributes one idea at a time without discussion or judgment. This approach ensures that all voices are heard equally and avoids the suppression of less dominant opinions. During the session, ideas were listed systematically for transparency and organization.
3. Clarification and Grouping of Ideas  
After all ideas are listed, participants collectively clarify each idea to ensure mutual understanding. Similar or related ideas are grouped together under common themes. This phase is crucial for eliminating redundancies and aligning shared perspectives. In this study, the group

focused on key elements such as curriculum design, industry collaboration, and sustainability competencies.

4. Prioritization through Voting

Participants vote to prioritize ideas based on their importance or relevance to the study's objectives. Voting is conducted anonymously to encourage honest opinions and minimize bias. The results were analyzed using a weighted scoring system, and the highest-priority ideas were used to address the study's objectives.

Throughout the NGT session, participants discussed elements related to sustainable practices, educational content, industry standards, and the alignment of landscape architecture education with sustainability goals. The session also produced a lasting record, with all ideas and decisions documented on flipchart sheets. These records served both as a reference for participants and as a foundation for further analysis in this research.

## RESULTS AND FINDINGS

### NGT Analysis

After running the NGT session, researchers have been able to identify the necessity of integrating sustainable development into landscape architecture education in Malaysia. The following elements have been derived from expert perspectives and opinions:

**Table 1.** *Expert Perspectives on Integrating Sustainable Development into Landscape Architecture Education in Malaysia*

Items/Elements	Voter 1	Voter 2	Voter 3	Voter 4	Voter 5	Voter 6	Voter 7	Total item score	Percentage	Rank Priority	Voter Consensus
Sustainable development is important in the landscape architecture industry	3	3	3	3	3	3	3	21	100	1	Suitable
There is a need for sustainability skills for landscape architecture graduates	3	3	3	3	3	3	3	21	100	1	Suitable
You are familiar with Education for Sustainable Development (ESD)	2	3	3	2	2	1	2	15	71.43	2	Suitable
There is a need to incorporate sustainability elements in the Landscape Architecture program	3	3	3	3	3	3	3	21	100	1	Suitable
There is a need to develop an educational framework for sustainable development in the Landscape Architecture Education for Malaysian context	3	3	3	3	3	3	3	21	100	1	Suitable

*Source:* Authors' own work

Table 1 presents the cumulative scores from the expert analysis on the need to integrate sustainability elements into landscape architectural education. The study's findings indicate a high level of consensus, with all evaluated items showing high percentage values. In line with previous NGT research (Deslandes et al., 2010; Dobbie et al., 2004), the acceptance percentage for items must exceed 70%. Among the five instruments analyzed, four achieved 100% approval, while one item reached 71%, specifically "You are familiar with Education for Sustainable Development (ESD)."

### Expert Perspectives on Sustainability Integration

The findings from expert interviews demonstrate a unanimous agreement on the critical need to integrate sustainability into landscape architecture education. This consensus highlights significant gaps in the current curriculum, where sustainability elements remain insufficiently embedded to meet industry expectations. Experts emphasized that equipping students with sustainability knowledge and skills is essential to prepare them for contemporary environmental challenges and market demands.

Expert E1 stated:

*"...need to let them understand what is sustainable. So that when they graduate, especially fresh graduates, they don't have any idea about this entire process..."*

This highlights a significant gap where graduates are unprepared to navigate sustainability requirements in the industry. E1's statement underscores the importance of foundational sustainability knowledge in preparing students for practical challenges upon graduation.

Expert E3 mentioned:

*"This is your opportunity... it's timely for you to look at it. Yes."*

This statement emphasizes the urgency of integrating sustainability into the curriculum, suggesting that the current period is critical for educational institutions to align their programs with industry trends.

Expert E7 added:

*"...if you talk about students, interns, they need to be exposed to it (sustainable development). Because the trend is moving in that direction..."*

E7's remark reflects the growing trend toward sustainability in the industry. The expert stresses that exposing students to sustainable development concepts early is crucial for aligning their skills with evolving market demands.

Furthermore, Expert E5 highlighted the lack of research and references in sustainable landscape architecture education:

*"I think this is very good because I realize this (research) is lacking. Very limited in terms of references and so on. So, it's actually good for you to explore... it's like you will pave the way for the future... provide something that will enlighten other students to go further in studying this. I find it very interesting that you could establish a sustainable development framework in landscape architecture..." - E5*

This underscores the need for foundational research to support curriculum development. E5's view indicates that developing a framework for sustainability in landscape architecture education could not only address industry needs but also serve as a reference for future research.

Experts E2, E4, and E6 provided additional insights into the types of sustainability aspects that should be integrated into the curriculum. They emphasized the following points:

- E2: "It's about balance. Balancing what the environment needs and what the design provides."
- E4: "You need to connect with what the community needs. That's sustainability too."
- E6: "Students must learn about managing resources—energy, water, even soil. That's what sustainability is all about."

These comments highlight the diverse nature of sustainability, encompassing environmental, social, and resource management aspects. The integration of these elements into the curriculum is essential to align with the global sustainability agenda and local industry needs.

While there is a strong agreement among the experts on the importance of sustainability in landscape architecture education, the data also reveals some gaps in knowledge regarding Education for Sustainable Development (ESD). Notably, only 71% of the experts were familiar with ESD principles, suggesting that while sustainability is acknowledged, there is a lack of in-depth understanding of how it can be effectively integrated into education. To address this, it is essential not only to embed sustainability within the curriculum but also to provide targeted training for educators, ensuring they can effectively deliver sustainable development concepts to students. Therefore, the proposed framework can align the educational programs with industry expectations, ensuring that graduates are equipped with the technical skills and values needed for sustainable development. The framework will also serve as a practical tool for curriculum developers, helping them create programs that are not only technically sound but also socially and environmentally responsible.

Based on the insights provided by the experts, several aspects of sustainability are particularly suited for integration into Education for Sustainable Development. These include environmental sustainability, which focuses on the preservation of natural resources, biodiversity, and ecosystems; economic sustainability, which emphasizes the need for designing cost-effective yet environmentally responsible projects; and social sustainability, which underscores the importance of creating inclusive and community-centered landscapes. These sustainability aspects align with global sustainability goals while also addressing local industry needs, making them not only relevant but also practical for inclusion in the curriculum.

These aspects reflect both global sustainability goals and local industry demands, making them highly relevant and practical for inclusion in the curriculum. Their integration ensures that graduates are well-prepared to contribute to sustainable development in their professional practices.

## **DISCUSSION**

The study results demonstrate that sustainable development has become an established practice within the landscape architecture industry in Malaysia, aligning with global initiatives such as the Sustainable Development Goals (SDGs). The evidence is clear, as all participants agreed on the importance of sustainability in this industry. They also recognized the necessity for landscape architecture graduates to possess sustainable skills that meet industry expectations for professionals capable of integrating sustainability principles into their practice. A unanimous consensus among experts highlighted the need for graduates to be equipped with sustainability skills in this field.

To effectively integrate sustainability into education, the Education for Sustainable Development (ESD) introduced by UNESCO serves as a crucial foundation. Although the current levels of awareness and understanding of ESD among industry professionals are pretty good, there is still potential for improvement. Enhanced collaboration between industry and academia is essential to ensure that knowledge and best practices in sustainable development are effectively shared and implemented, benefiting both educational institutions and industry stakeholders who will employ these graduates (Caniglia et al., 2018; Muogahlu & Ahmad, 2023).

From this perspective, items 3 and 4 in the study raise critical questions about the need to integrate sustainable elements into the Landscape Architecture programme and the development of an educational framework specifically for the Malaysian context. Both items achieved a complete (100%)

agreement, underscoring the necessity to revise and enhance existing curricula to address the conditions and sustainability challenges faced by the landscape industry in Malaysia. According to (Kaliappan & Hamid, 2021), such a new educational framework could serve as a comprehensive guide for educational institutions in their efforts to embed sustainable elements into their curricula. In conclusion, this study's findings highlight the industry's urgent need and readiness to embrace sustainable education in landscape architecture. Educational institutions must consider these findings in designing and implementing their curricula to align with industry needs and contribute to the country's sustainable development goals.

## **CONCLUSION**

This study reveals an urgent need to incorporate sustainable development into landscape architecture education in Malaysia. The low understanding of sustainable development education (ESD) among industry players highlights that collaboration between industry and academia needs to be improved. Therefore, it is essential to develop a comprehensive sustainable development education framework for landscape architecture education in Malaysia that will help ensure that landscape architecture graduates can meet the current demands of industry.

## **IMPLICATIONS OF THE STUDY**

The study emphasises the significance of sustainable development within Malaysia's landscape architecture sector, which aligns with the Sustainable Development Goals (SDGs). The participants' agreement on sustainability emphasises the urgent need for landscape architecture graduates to acquire sustainable skills that meet industry demands. This consensus highlights the importance of revising the existing curriculum and creating a framework for sustainable education that is specific to industry needs. Therefore, industry and academia must work together more closely to effectively integrate sustainable practices into education. The study's findings highlight how urgently educational establishments must modify their courses to meet industrial demands curricula to address local sustainability challenges and industry requirements.

## **LIMITATIONS AND RECOMMENDATIONS FOR FUTURE RESEARCH**

There are some limitations to this study: the sample size and diversity of participants in this research may only partially represent some sectors within the landscape architecture industry in Malaysia, thereby restricting the generalizability of the results. In addition, while expert viewpoints are essential, a more comprehensive understanding of the needs in the field of sustainable education might have been obtained from a broader range of stakeholder feedback, including that from governmental and non-governmental groups. Thus, future research should be considered for long-term studies that track changes and trends in sustainable development and educational requirements within the context of the Malaysian landscape architecture industry. Expanding the involvement of stakeholders, such as policymakers, industry associations, and environmental non-governmental organizations, would also be advantageous in obtaining a more comprehensive understanding of the demands for sustainable education. Finally, conducting impact assessments of educational interventions aimed at embedding sustainability into curricula would be essential to evaluate their effectiveness in meeting industry demands and contributing to the SDG's.

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