

Web-Based Sustainability Disclosure Practices in Malaysian Public and Private Universities: Evidence from Content Analysis Approach

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ARTICLE INFO

Keywords

Digital transparency;
Higher education sustainability;
Sustainability disclosure index;
Institutional accountability;
Stakeholder communication

Article History

March 7, 2026: Article submitted.

March 10, 2026: Revision requested (template).

March 13, 2026: First revision submitted.

March 14, 2026: Reference update requested.

March 23, 2026: Second revision submitted.

March 28, 2026: Reviewer comments received.

March 28, 2026: Editorial decision issued.

ABSTRACT

Universities are increasingly expected to demonstrate transparency and accountability in addressing environmental and social challenges aligned with sustainable development. Web-based sustainability reporting has emerged as an important communication tool that allows higher education institutions to disclose sustainability initiatives and engage stakeholders effectively. This study aimed to examine the extent of sustainability information disclosed on university websites and to compare disclosure practices between public and private universities in Malaysia. A quantitative research design was employed using content analysis of official university websites. The population consisted of 20 public universities and 48 full private universities in Malaysia. Data were collected using a web-based sustainability reporting index consisting of 83 disclosure items across nine dimensions categorized into general, sustainability-specific, and university-specific aspects. The collected data were analyzed using descriptive statistics with SPSS, followed by independent sample t-tests and Mann-Whitney U tests to examine differences between institutional types. The findings indicated that Malaysian universities generally disclose sustainability information at a moderate level, with the highest disclosure found in general sustainability information (65%). Within sustainability-specific disclosures, the social dimension showed the highest level of reporting compared to economic and environmental aspects. The results also revealed that public universities demonstrate higher levels of sustainability disclosure than private universities across most dimensions. This study provides empirical evidence on the current state of digital sustainability disclosure in Malaysian higher education institutions. The findings contribute to the literature on sustainability reporting and offer practical insights for policymakers and university management in improving transparency, stakeholder communication, and institutional sustainability practices.

1. Introduction

Sustainability has become a central issue in global development, particularly following the increasing global commitment to the Sustainable Development Goals (SDGs). These goals emphasize the need to balance economic growth, social inclusion, and environmental protection. Higher education institutions play a

strategic role in advancing sustainable development, as they are responsible for knowledge creation, educating future leaders, and influencing societal transformation. Consequently, universities are increasingly expected to demonstrate transparency and accountability regarding their sustainability initiatives through various reporting

mechanisms, including sustainability reporting and digital disclosure ([Ceulemans et al., 2021](#); [Lozano et al., 2022](#)).

Globally, sustainability reporting has gained significant attention across sectors as stakeholders demand greater transparency regarding environmental, social, and governance (ESG) practices. In the higher education sector, sustainability reporting functions as an important communication tool that enables universities to inform stakeholders about their sustainability-related policies, programs, and achievements ([Hinson et al., 2020](#); [Adams & Larrán, 2021](#)). With the rapid development of information and communication technologies (ICT), universities increasingly utilize digital platforms such as websites to disclose sustainability information more effectively. Web-based sustainability reporting allows institutions to disseminate information in real time, reach broader audiences, and enhance stakeholder engagement ([Manes-Rossi et al., 2021](#)).

In the Malaysian context, universities represent a crucial sector in supporting national development and sustainability agendas. Malaysia has demonstrated strong commitment to sustainability by integrating SDGs into national policies and higher education frameworks. Universities are expected not only to incorporate sustainability into teaching, research, and community engagement but also to demonstrate accountability through transparent disclosure practices. Web-based sustainability reporting has therefore become an essential channel for communicating sustainability efforts to stakeholders, including students, policymakers, industry partners, and society. By providing accessible and structured sustainability information through institutional websites, universities can enhance legitimacy, institutional reputation, and public trust.

Despite the increasing importance of sustainability reporting in higher education, existing studies indicate that disclosure practices among universities remain uneven and underdeveloped. Recent research shows

that sustainability reporting in universities continues to evolve, with varying levels of disclosure quality and consistency across institutions ([Ceulemans et al., 2021](#); [Gamage & Sciulli, 2021](#)). Although many universities have implemented sustainability initiatives, the communication of such initiatives is often fragmented and lacks standardization. Furthermore, the absence of universally accepted reporting frameworks for higher education contributes to inconsistencies in disclosure practices.

In addition, most prior studies on sustainability reporting in higher education focus on developed countries, resulting in limited empirical evidence from emerging economies, including Malaysia. While some studies have explored sustainability initiatives in universities, fewer studies have systematically examined the extent of sustainability information disclosed through institutional websites. Moreover, comparative analyses between public and private universities remain limited, despite differences in governance structures, resource availability, and stakeholder expectations.

Based on these gaps, this study addresses the extent to which Malaysian universities disclose sustainability information through their official websites and examines whether differences exist between public and private universities in web-based sustainability reporting practices. Understanding these practices is important for evaluating institutional transparency and accountability, as well as identifying areas for improvement.

Therefore, this study aims to investigate the level of web-based sustainability reporting among Malaysian universities by analyzing sustainability-related information disclosed on their official websites. Specifically, the study seeks to answer two research questions: (1) To what extent do Malaysian universities disclose sustainability information through their websites? and (2) Are there significant differences in disclosure practices between public and private universities? By addressing

these questions, the study provides a comprehensive understanding of sustainability disclosure practices in the Malaysian higher education sector.

This research contributes to the literature in several ways. Theoretically, it extends existing studies on sustainability reporting by providing empirical evidence on web-based disclosure practices in a developing country context. Practically, the findings offer insights for policymakers, university administrators, and stakeholders in improving transparency and sustainability communication. The novelty of this study lies in its comprehensive assessment of sustainability disclosure using a structured reporting index and its comparative analysis between public and private universities.

2. Literature Review

2.1 Conceptual and Theoretical Foundations

Sustainability reporting has emerged as an important mechanism for organizations to communicate their environmental, social, and governance (ESG) performance to stakeholders. In recent years, sustainability disclosure has become increasingly relevant not only in the corporate sector but also within public institutions, including universities. Higher education institutions are now expected to integrate sustainability principles into their core activities, such as teaching, research, campus operations, and community engagement. In this context, sustainability reporting serves as a strategic communication tool that enables universities to demonstrate accountability and transparency regarding their contributions to sustainable development ([Ceulemans et al., 2021](#); [Lozano et al., 2022](#); [Adams & Larrán, 2021](#); [Bice & Coates, 2021](#)). Recent literature highlights that sustainability reporting in universities is closely linked to broader global initiatives such as the Sustainable Development Goals (SDGs).

Universities are increasingly expected to align their institutional strategies with sustainability frameworks and communicate

their sustainability initiatives to internal and external stakeholders. According to recent studies, universities that actively disclose sustainability-related information tend to enhance institutional legitimacy, improve stakeholder trust, and strengthen their reputation in the global academic environment ([Larrán Jorge et al., 2021](#); [Aversano et al., 2022](#); [Farneti et al., 2023](#)). One of the most widely used theoretical perspectives to explain sustainability disclosure practices is legitimacy theory.

Legitimacy theory suggests that organizations seek to ensure that their operations are perceived as consistent with societal norms, values, and expectations ([Suchman, 1995](#)). In the context of higher education institutions, sustainability reporting functions as a mechanism through which universities demonstrate their commitment to environmental responsibility, social development, and ethical governance. Recent empirical evidence indicates that universities increasingly utilize sustainability disclosure as a strategy to maintain institutional legitimacy, particularly in an era where stakeholders demand greater transparency and accountability ([Ceulemans et al., 2021](#); [Manes-Rossi et al., 2022](#); [Nicolò et al., 2023](#)). Another important theoretical perspective is stakeholder theory.

Stakeholder theory argues that organizations must consider the interests and expectations of multiple stakeholder groups, including students, faculty members, government agencies, industry partners, and the broader community. In the context of universities, stakeholder expectations play a critical role in shaping sustainability disclosure practices. Recent research shows that universities increasingly respond to stakeholder pressure by enhancing the transparency of their sustainability initiatives and integrating sustainability information into institutional websites and digital communication platforms ([Larrán Jorge et al., 2021](#); [Vitolla et al., 2021](#); [Dienes et al., 2023](#);

[Buallay et al., 2022](#)). In addition to legitimacy and stakeholder theories, institutional theory also provides valuable insights into sustainability reporting practices. Institutional theory suggests that organizations adopt certain practices due to external pressures from regulatory frameworks, industry standards, and societal expectations ([DiMaggio & Powell, 1983](#)).

Within higher education, sustainability reporting may be influenced by government policies, international sustainability rankings, and competition among universities. Recent studies confirm that institutional pressures, including global sustainability frameworks and benchmarking systems, play an important role in encouraging universities to adopt sustainability reporting practices ([Lozano et al., 2022](#); [Farneti et al., 2023](#); [Nicolò et al., 2023](#); [Aversano et al., 2022](#)).

The integration of these theoretical perspectives provides a comprehensive understanding of sustainability disclosure in universities. Legitimacy theory explains the need for social acceptance, stakeholder theory highlights the importance of responding to stakeholder expectations, while institutional theory explains how sustainability reporting practices diffuse across institutions. Together, these perspectives form a strong conceptual foundation for examining sustainability reporting practices in higher education institutions.

2.2 Review of Empirical Studies

Over the past decade, a growing number of empirical studies have examined sustainability reporting practices in higher education institutions across different countries and regions. These studies generally indicate that sustainability reporting in universities is still evolving and varies significantly depending on institutional characteristics, governance structures, and regional contexts. For instance, research conducted by [Ceulemans et al. \(2021\)](#) demonstrates that sustainability reporting

among European universities has increased significantly, although the quality and comprehensiveness of reporting remain inconsistent.

Similarly, [Lozano et al. \(2022\)](#) found that while many universities have adopted sustainability initiatives, only a limited number provide structured and comprehensive sustainability reports aligned with recognized reporting frameworks. Recent studies also emphasize the growing role of digital communication in sustainability disclosure. [Adams and Larrán \(2021\)](#) report that universities increasingly disclose sustainability information through institutional websites rather than relying solely on traditional sustainability reports. Web-based reporting allows universities to provide dynamic, accessible, and frequently updated sustainability information.

Supporting this view, [Aversano et al. \(2022\)](#) and [Farneti et al. \(2023\)](#) argue that digital platforms play a crucial role in enhancing transparency and stakeholder engagement. In the Asian context, empirical evidence suggests that sustainability disclosure practices remain uneven and still developing. [Gamage and Sciulli \(2021\)](#) found that sustainability reporting among Asian universities is relatively limited compared to institutions in Europe and North America. Similarly, [Hinson et al. \(2020\)](#) highlight that many universities disclose sustainability information in fragmented forms across various website sections rather than through integrated sustainability frameworks.

More recent studies confirm that universities in developing regions often face challenges related to reporting standards, institutional resources, and sustainability governance structures ([Khan et al., 2022](#); [Yusoff et al., 2023](#)). Several empirical studies have also examined the determinants of sustainability disclosure in higher education institutions. Institutional size, governance structure, stakeholder pressure, and availability of resources are among the key factors influencing sustainability reporting practices.

[Bice and Coates \(2021\)](#) emphasize that universities with stronger governance systems and strategic sustainability commitments tend to demonstrate higher levels of sustainability disclosure. Similarly, [Vitolla et al. \(2021\)](#) and [Bualay et al. \(2022\)](#) highlight that governance quality and stakeholder engagement significantly influence sustainability reporting practices. Other studies suggest that institutional context also plays an important role. Public universities often face stronger accountability requirements due to government oversight and public funding mechanisms, which may lead to more comprehensive sustainability disclosure compared to private institutions. [Manes-Rossi et al. \(2022\)](#) and [Nicolò et al. \(2023\)](#) confirm that public sector organizations, including universities, tend to adopt sustainability reporting practices to enhance transparency and accountability.

Despite the growing body of literature on sustainability reporting in higher education, empirical evidence remains limited in several regions, particularly in Southeast Asia. This highlights the need for further research that explores sustainability disclosure practices within specific national contexts.

2.3 Identification of the Research Gap

Although sustainability reporting in higher education has received increasing scholarly attention, several important research gaps remain in the existing literature. First, many prior studies focus primarily on sustainability initiatives, sustainability performance, or sustainability management practices rather than on the communication and disclosure of sustainability information through digital platforms. With the rapid development of digital technologies, web-based sustainability reporting has become an important area of study that requires further investigation ([Aversano et al., 2022](#); [Farneti et al., 2023](#)). Second, most empirical studies on sustainability reporting in universities focus on institutions located in developed countries, particularly in Europe, North America, and Australia.

As a result, there is limited empirical evidence from developing countries and emerging economies. Studies examining sustainability disclosure practices in Southeast Asian universities remain relatively scarce ([Khan et al., 2022](#); [Yusoff et al., 2023](#)). Third, existing literature rarely provides a systematic comparison between public and private universities regarding sustainability disclosure practices. Public and private universities differ in governance structures, funding models, and stakeholder expectations, which may influence their reporting behavior and transparency practices ([Nicolò et al., 2023](#); [Rahman et al., 2024](#)).

Therefore, this study addresses these gaps by examining web-based sustainability reporting practices among Malaysian universities and comparing disclosure practices between public and private institutions. By focusing on digital sustainability disclosure, this research provides a more comprehensive understanding of how universities communicate sustainability initiatives in the digital era.

2.4 Development of the Conceptual Framework

Recent studies indicate that governance mechanisms play a crucial role in shaping sustainability performance and disclosure practices within organizations. Governance structures influence how organizations formulate sustainability strategies, implement sustainability initiatives, and communicate sustainability performance to stakeholders ([Bualay et al., 2022](#); [Vitolla et al., 2021](#); [Dienes et al., 2023](#)). In the context of this study, Islamic Corporate Governance (ICG) represents a governance framework that incorporates Islamic ethical principles, including transparency, accountability, fairness, and compliance with Shariah principles.

Organizations operating under Islamic governance structures are expected to prioritize ethical conduct and social responsibility. Recent research suggests that

governance systems rooted in ethical and religious values can positively influence sustainability performance and long-term organizational value creation (Khan et al., 2022; Rahman et al., 2024). Sustainability performance refers to the ability of organizations to achieve balanced outcomes across economic, social, and environmental dimensions.

In universities and institutions adopting Islamic governance frameworks, sustainability performance reflects the alignment between governance principles and institutional strategies aimed at promoting sustainable development. Ownership structure also plays a significant role in influencing governance effectiveness and sustainability outcomes. Insider ownership refers to ownership held by managers or internal stakeholders within the organization. Higher levels of insider ownership may encourage managers to align their decisions with long-term organizational goals, including sustainability objectives. On the other hand, institutional ownership refers to

ownership held by institutional investors who may exert monitoring pressure on management to improve governance quality and sustainability performance (Nicolò et al., 2023; Manes-Rossi et al., 2022).

Based on these arguments, Islamic corporate governance is expected to positively influence sustainability performance. However, the strength of this relationship may vary depending on ownership structures within the organization. Insider ownership and institutional ownership may act as moderating variables that strengthen or weaken the relationship between governance practices and sustainability outcomes. Thus, this study proposes a conceptual framework that examines the influence of Islamic corporate governance on sustainability performance, with insider ownership and institutional ownership serving as moderating variables. This framework provides a theoretical basis for understanding how governance structures and ownership dynamics interact to influence sustainability outcomes in organizations.

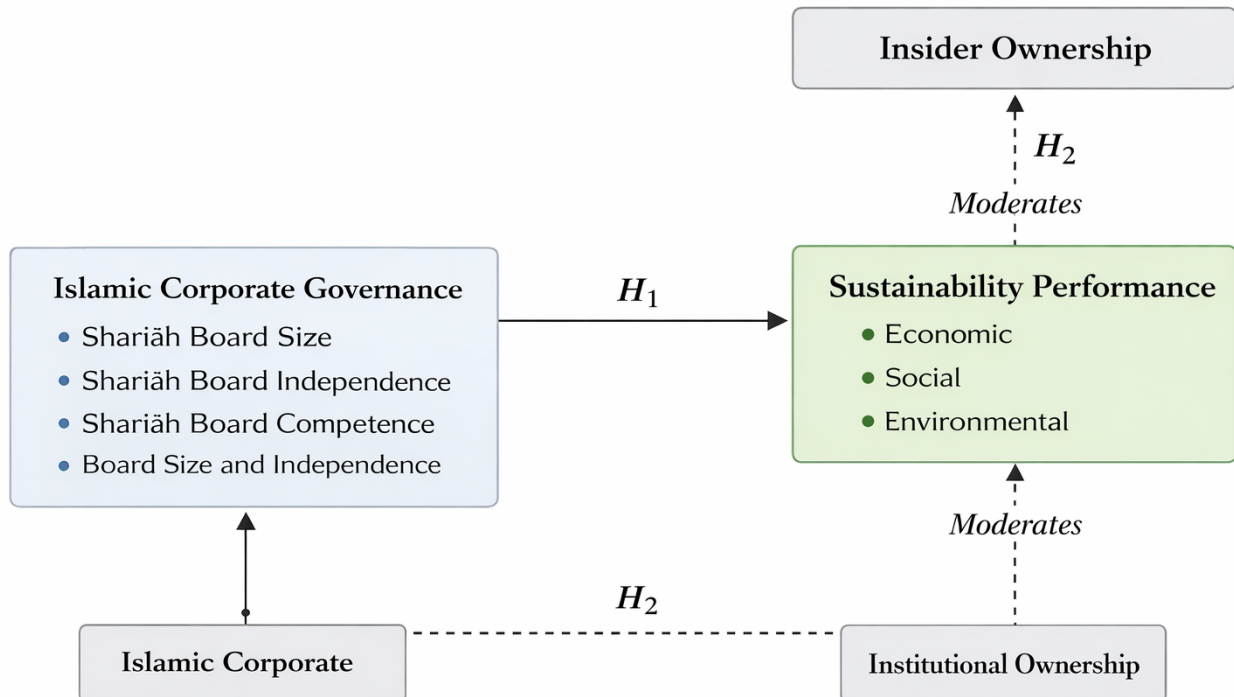


Fig. 1. Conceptual Framework of the Study

2.5 Hypotheses or Research Propositions

Based on the conceptual framework and theoretical arguments, the following hypotheses are proposed:

H1: Islamic Corporate Governance has a positive effect on sustainability performance.

Islamic governance mechanisms emphasize ethical conduct, transparency, and accountability, which are consistent with sustainability principles. Organizations implementing strong Islamic governance structures are therefore more likely to achieve better sustainability performance.

H2: Insider ownership moderates the relationship between Islamic Corporate Governance and sustainability performance.

Higher insider ownership aligns managerial interests with organizational objectives, encouraging management to implement governance practices that support long-term sustainability outcomes.

H3: Institutional ownership moderates the relationship between Islamic Corporate Governance and sustainability performance.

Institutional investors often demand greater transparency and responsible governance practices. Therefore, higher institutional ownership may strengthen the impact of Islamic corporate governance on sustainability performance.

3. Research Methods

The research methodology section explains how the study is designed and conducted to answer the research questions and achieve the research objectives. This section is structured systematically to ensure transparency, rigor, and replicability of the study. In line with standards commonly adopted in reputable international journals, the methodology demonstrates alignment between the research design, data collection procedures, and analytical techniques. Furthermore, the study employs valid and reliable research instruments while adhering to ethical standards and appropriate analytical procedures to address the identified research gap. A well-

structured methodology allows reviewers and readers to assess the credibility of the findings and the contribution of the study to the existing literature.

3.1 Research Design

This study adopts a quantitative research design using content analysis to examine the extent of sustainability information disclosed on university websites in Malaysia. Content analysis is widely applied in disclosure studies as it allows researchers to systematically evaluate the presence and extent of specific information within written materials or digital media.

The rationale for selecting this design lies in its suitability for measuring the level of web-based sustainability disclosure across universities in a consistent and objective manner. Through content analysis, the study systematically reviews the official websites of universities and identifies sustainability-related information based on a predefined sustainability reporting index. The design enables the study to quantify disclosure practices and compare the reporting levels between public and private universities, thereby addressing the research questions effectively.

3.2 Research Context and Setting

The research is conducted within the context of higher education institutions in Malaysia, which have increasingly adopted sustainability initiatives aligned with the Sustainable Development Goals (SDGs). Malaysian universities are considered an important sector in advancing sustainability awareness, education, and social responsibility. Malaysia currently has 20 public universities and 447 private higher learning education institutions (HLEIs). Private HLEIs consist of several categories including full universities, branch campuses, university colleges, and colleges. For the purpose of this study, the research focuses on all 20 public universities and 48 full private universities. These

institutions were selected because they represent the primary universities with comprehensive academic structures and public visibility through official websites.

The list of public universities was obtained from the official portal of the Malaysian Ministry of Higher Education (MOHE). The selection of Malaysian universities provides a relevant context for examining sustainability disclosure practices within a developing country that actively promotes sustainability agendas.

3.3 Population and Sample / Research Participants

The population of this study consists of all universities operating in Malaysia. However, due to variations in institutional categories and

website availability, the study focuses specifically on public universities and full private universities. The sample selection was conducted using purposive sampling, where institutions were selected based on their relevance to the research objectives and the availability of official websites containing institutional information.

The final sample consists of:

- 20 public universities
- 48 full private universities

Thus, the total sample size is 68 universities. This sample size is considered adequate to represent the sustainability reporting practices of Malaysian universities and allows comparison between institutional types.

Table 1. Research Sample of Malaysian Universities

Category	Number of Universities
Public Universities	20
Full Private Universities	48
Total	68

3.4 Data Sources and Data Collection

This study uses secondary data obtained from official university websites. The data collection process involves examining the sustainability-related information disclosed on the websites of the selected universities.

The data were collected using content analysis, which focuses on systematically reviewing written materials and digital communication to identify the presence of specific information. Content analysis is widely used in voluntary disclosure research because it allows objective and replicable measurement of disclosure practices.

The data collection period was limited to two months (September–October 2021) to ensure consistency in website content, as information on websites can change frequently. The process involved reviewing each university website and identifying sustainability-related disclosures based on a Web-based

Sustainability Reporting Index developed for this study.

3.5 Measurement of Variables and Research Instruments

The key variable examined in this study is Web-Based Sustainability Reporting (WBSR). This variable is measured using a Sustainability Reporting Index developed specifically for university website disclosures. The index was constructed through an eight-stage development process:

1. Reviewing international literature on sustainability disclosure.
2. Identifying sustainability-related disclosure items.
3. Removing irrelevant items and adding new items.
4. Conducting a preliminary test on two university websites.
5. Revising the items based on the preliminary findings.

6. Preparing the sustainability disclosure index.
7. Validating the index with two academic experts.

8. Finalizing the disclosure index.

The final index consists of 83 disclosure items categorized into three main themes and nine sub-dimensions.

Table 2. Index for the Web-Based Sustainability Reporting

Dimensions	Sub-Dimensions	Number of Items
General	General Sustainability Online Disclosure	5
	Formal Statement	4
	Organizational Profile and Governance	8
Sustainability Specific	Economy	14
	Social	13
	Environment	17
University Specific	Research on Sustainability Topics	10
	Curriculum and Teaching on Sustainability Topics	9
	Outreach	3
Total	9 Sub-dimensions	83 Items

The scoring method uses a dichotomous approach, where:

1. Score = 1 if the item is disclosed on the website
2. Score = 0 if the item is not disclosed

This approach is consistent with prior disclosure studies and enables objective measurement of sustainability reporting practices.

3.6 Data Analysis Techniques

The collected data were analyzed using descriptive and inferential statistical techniques. First, descriptive statistics were used to examine the level of sustainability disclosure across universities. The analysis includes frequency distribution, mean scores, standard deviations, and percentages for each disclosure dimension.

Second, inferential statistical analysis was conducted to determine whether there are significant differences in sustainability reporting between public and private universities. Two statistical tests were employed:

1. Independent Sample t-test
2. Mann-Whitney U Test

These tests were used to compare the mean disclosure scores between the two groups

of universities. All statistical analyses were conducted using Statistical Package for Social Sciences (SPSS) version 23.0.

3.7 Validity, Reliability, and Trustworthiness

To ensure the robustness of the research instrument, several procedures were undertaken. First, content validity was ensured by developing the sustainability disclosure index based on extensive literature review and established sustainability frameworks. The index items were also validated by two academic experts with expertise in sustainability reporting and accounting research.

Second, instrument reliability was strengthened through the use of a structured coding procedure during the content analysis process. The coding framework ensured consistency in identifying and recording disclosure items across university websites. These procedures enhance the credibility and reliability of the study findings.

3.8 Ethical Considerations

This research adheres to standard ethical principles in academic research. Since the study relies solely on publicly available

information from university websites, it does not involve human participants or confidential institutional data. All data were collected from official institutional sources and used strictly for academic purposes. The study ensures transparency in data collection and analysis, while respecting intellectual property and institutional integrity.

3.9 Research Procedure

The research process was conducted through several systematic stages:

1. Research planning, including formulation of research questions and literature review.
2. Development of the sustainability disclosure index based on prior studies and international frameworks.
3. Validation of the index by academic experts.
4. Selection of sample universities consisting of public and private institutions in Malaysia.
5. Data collection through content analysis of university websites.
6. Coding of sustainability disclosure items using the dichotomous scoring method.
7. Statistical analysis using descriptive and inferential techniques with SPSS.
8. Interpretation and reporting of findings.

This structured procedure ensures methodological transparency and supports the replicability of the research.

3.10 Methodological Limitations

Despite its contributions, this study has several methodological limitations. First, the research focuses solely on website disclosures, which may not fully capture all sustainability activities undertaken by universities. Some institutions may report sustainability initiatives through other channels such as social media, annual reports, or internal documents. Second, the data collection was limited to a two-month period, and website content may change over time. Therefore, the findings represent the

disclosure practices at the time of data collection. Future research could address these limitations by conducting longitudinal analysis or incorporating additional data sources such as sustainability reports, interviews with university management, or other digital communication platforms.

4. Results and Discussion

This section reports and discusses the empirical findings of the study in a structured and transparent manner. The results subsection presents the outcomes of the data analysis objectively using tables to summarize the statistical findings. The discussion subsection then interprets these results by linking them to existing theories and previous empirical studies in sustainability reporting and higher education. Together, these subsections demonstrate how the findings address the research questions and contribute to the existing literature on sustainability disclosure practices in universities.

4.1 Research Results

4.1.1 Sample Description and Descriptive Statistics

This study examines the level of web-based sustainability reporting among Malaysian universities by analyzing 83 disclosure items grouped into nine dimensions across three main categories: general, sustainability-specific, and university-specific. The general category covers general sustainability online disclosure, formal statements, and organizational profile and governance. The sustainability-specific category includes economic, social, and environmental aspects. Meanwhile, the university-specific category encompasses research on sustainability topics, curriculum and teaching on sustainability topics, and outreach activities. The overall descriptive statistics of the sustainability disclosure index across Malaysian universities are presented in Table 2.

Table 2: Web-based Disclosure Index of Malaysian Universities

Dimension	Total Items	Mean Score	Std. Dev.	%	Variance
General Characteristic	17	0.64	0.47	65%	22.83
Sustainability Specific	44	0.35	0.48	56%	22.85
Universities Specific	22	0.45	0.50	46%	24.80

Table 2 shows that the General Characteristic dimension recorded the highest level of disclosure, with a mean score of 0.64 (65%), followed by Sustainability Specific disclosure (56%) and University Specific disclosure (46%).

4.1.2 Data Quality and Preliminary Analysis

To ensure the quality of the data used in this study, descriptive statistics were examined to assess the distribution and variation of the sustainability disclosure index. The standard deviation values across all dimensions indicate

moderate variability in disclosure practices among universities. The dichotomous scoring system (1 = disclosed, 0 = not disclosed) ensures objective measurement of the presence of sustainability information on university websites. This approach has been widely used in voluntary disclosure research to evaluate sustainability reporting practices.

4.1.3 Main Analytical Results

Further analysis was conducted to examine the level of disclosure across each sub-dimension within the three main categories.

Table 3: Web-Based Sustainability Reporting based on General Characteristic Dimension

Dimension	Total Items	Mean	Std. Dev.	%	Variance
General Sustainability Online Disclosure	5	0.63	0.48	63%	23.39
Formal Statement	4	0.69	0.46	69%	21.42
Organizational Profile and Governance	8	0.64	0.48	63%	23.15
Total	17	0.64	0.47	65%	22.83

Table 3 shows that the Formal Statement sub-dimension recorded the highest disclosure level (69%), followed by Organizational Profile and Governance (63%)

and General Sustainability Online Disclosure (63%).

Table 4: Web-Based Sustainability Reporting based on Sustainability Specific Dimension

Dimension	Total Items	Mean	Std. Dev.	%	Variance	Min	Max
Economy	14	0.37	0.48	49%	23.39	0	1
Social	13	0.48	0.50	66%	25.00	0	1
Environment	17	0.24	0.43	54%	18.17	0	1
Total	44	0.35	0.48	56%	22.85	0	1

As shown in Table 4, the Social dimension recorded the highest disclosure level

(66%), followed by Environment (54%) and Economic disclosure (49%).

Table 5: Web-Based Sustainability Reporting based on Universities Specific Dimension

Dimension	Total Items	Mean	Std. Dev.	%	Variance	Min	Max
Research on Sustainability Topics	10	0.44	0.50	44%	24.65	0	1
Curriculum and Teaching on Sustainability Topics	9	0.46	0.50	47%	24.87	0	1
Outreach	3	0.50	0.50	50%	25.12	0	1
Total	22	0.45	0.50	46%	24.80	0	1

The results indicate that the Outreach dimension has the highest disclosure level (50%) among the university-specific categories.

4.1.4 Hypothesis Testing Results / Key Findings

To further investigate whether there is a difference in sustainability reporting practices

between public and private universities, statistical tests were conducted using the Independent Sample t-test and Mann-Whitney U Test.

Table 6: Difference in the Web-Based Sustainability Reporting between Public and Private Universities

	Public Universities		Private Universities		T-test	Mann Whitney U Test
Web-Based Sustainability Reporting	Mean	STD	Mean	STD	P-value	P-value
General	0.81	0.39	0.58	0.49	0.00	0.00
Sustainability Specific	0.56	0.50	0.27	0.44	0.00	0.00
University Specific	0.70	0.46	0.35	0.48	0.00	0.00

P-Value = The significance level is 0.05

The results indicate that public universities exhibit higher mean disclosure scores across all sustainability reporting dimensions compared to private universities.

4.2 Research Discussion

4.2.1 Interpretation of Key Findings

The findings indicate that Malaysian universities demonstrate varying levels of sustainability disclosure on their official websites. The General Characteristic dimension shows the highest disclosure level, suggesting that universities tend to prioritize general sustainability statements, governance structures, and institutional profiles when communicating sustainability-related information.

The Social dimension within sustainability-specific disclosures also records

a relatively high score, indicating that universities emphasize social responsibilities such as community engagement, student welfare, and social development initiatives. This reflects the strong societal role of universities in contributing to community development and social sustainability.

Furthermore, the Outreach dimension records the highest disclosure level within the university-specific category, suggesting that universities actively communicate their engagement with external stakeholders, including communities, industry partners, and government institutions.

4.2.2 Comparison with Previous Studies

The findings of this study are consistent with previous research examining sustainability reporting in higher education

institutions. For instance, studies by Antonio Fonseca et al. and Karen [Ceulemans et al.](#) highlight that sustainability reporting practices in universities remain at an early stage of development. Similarly, the results align with the findings of Carol Adams, who suggests that sustainability initiatives in universities are often communicated through general statements and institutional commitments rather than detailed sustainability performance metrics. The higher emphasis on social disclosure found in this study also reflects previous studies indicating that universities prioritize social and educational responsibilities within sustainability frameworks.

4.2.3 Theoretical Contributions

This study contributes to the literature on sustainability reporting in higher education by providing empirical evidence on web-based sustainability disclosure practices among Malaysian universities. The findings extend existing research by demonstrating how universities use digital platforms, particularly websites, as communication tools for sustainability initiatives. The study also highlights the multidimensional nature of sustainability disclosure within the higher education context, encompassing general institutional information, sustainability-specific initiatives, and university-specific activities. These findings contribute to the theoretical discussion on stakeholder theory and legitimacy theory, which suggest that organizations disclose sustainability information to maintain legitimacy and meet stakeholder expectations.

4.2.4 Practical and Policy Implications

The findings provide several implications for university management and policymakers. First, universities should strengthen the depth and consistency of sustainability disclosure, particularly in economic and environmental aspects, which currently show lower levels of reporting.

Second, policymakers and higher education regulators may consider developing sector-specific sustainability reporting guidelines for universities to encourage more standardized disclosure practices. Third, universities should leverage digital platforms such as websites and online reporting systems to improve transparency and stakeholder engagement in sustainability initiatives.

4.2.5 Integration with the Research Gap

This study addresses the research gap identified in the literature regarding the limited empirical evidence on web-based sustainability reporting in higher education institutions, particularly in the Malaysian context. While previous studies have focused mainly on sustainability reporting in corporate sectors or traditional sustainability reports, this study highlights the role of web-based communication channels in sustainability disclosure. By examining Malaysian universities, the study provides new insights into how higher education institutions communicate sustainability initiatives to stakeholders.

4.2.6 Acknowledgement of Study Limitations

Despite providing valuable insights, this study has several limitations. First, the analysis focuses exclusively on website disclosures, which may not fully represent the complete sustainability activities undertaken by universities.

Second, the results reflect the specific time period of data collection, and website content may change over time as universities update their sustainability information. Future research could expand the scope by incorporating additional data sources such as sustainability reports, annual reports, and interviews with university administrators to gain a deeper understanding of sustainability reporting practices in higher education institutions.

5. Conclusion

The conclusion section synthesizes the main findings of the study and highlights their significance without introducing new empirical evidence. This study investigated the extent of web-based sustainability reporting among Malaysian universities and examined whether differences exist between public and private universities. The findings demonstrate that Malaysian universities have begun integrating sustainability communication through their official websites, although the level of disclosure varies across sustainability dimensions. Overall, the results provide empirical insights into the current status of sustainability disclosure practices in the Malaysian higher education sector and highlight areas where further improvements are necessary. The conclusion also outlines the theoretical contributions of the study, practical implications for stakeholders, and potential directions for future research.

5.1 Summary of Key Findings

This study examined the level of web-based sustainability disclosure among Malaysian universities using a sustainability reporting index consisting of 83 disclosure items across nine dimensions. The findings indicate that Malaysian universities generally disclose sustainability-related information on their websites, although the level of disclosure varies across categories.

The general sustainability disclosure dimension recorded the highest level of reporting compared to other dimensions, indicating that universities tend to emphasize general sustainability statements, organizational governance, and institutional commitments in their online communication. Within the sustainability-specific dimension, social disclosure showed the highest level of reporting, suggesting that universities place strong emphasis on social responsibilities such as community engagement, student welfare, and social initiatives.

In the university-specific dimension, the outreach category recorded the highest

disclosure level, highlighting the importance of stakeholder engagement and external collaboration in university sustainability activities. In addition, the comparative analysis revealed that public universities demonstrate higher levels of web-based sustainability disclosure compared to private universities across all reporting dimensions.

Overall, the findings indicate that while Malaysian universities have begun integrating sustainability communication through digital platforms, the depth and consistency of sustainability reporting still vary across institutions and dimensions.

5.2 Theoretical Contributions

This study contributes to the growing literature on sustainability reporting in higher education institutions, particularly in the context of web-based disclosure practices. By examining sustainability reporting through university websites, the study extends previous research that primarily focused on standalone sustainability reports or traditional corporate disclosure mechanisms.

The findings support theoretical perspectives derived from stakeholder theory and legitimacy theory, which suggest that organizations disclose sustainability-related information to meet stakeholder expectations and maintain institutional legitimacy. In the context of higher education institutions, web-based sustainability reporting can be interpreted as a strategic communication tool used by universities to demonstrate their commitment to social responsibility and sustainable development.

Furthermore, this study contributes to the academic literature by providing empirical evidence from a developing country context, where sustainability reporting practices in universities remain relatively underexplored. The findings therefore extend existing research by highlighting how universities in emerging economies utilize digital platforms to communicate sustainability initiatives.

5.3 Practical and Policy Implications

The findings of this study provide several practical implications for university management, policymakers, and stakeholders in the higher education sector.

First, university management should strengthen the quality and comprehensiveness of sustainability disclosures on their official websites. While general sustainability statements are widely reported, more detailed disclosures related to environmental and economic sustainability should be further developed to enhance transparency and accountability.

Second, policymakers and higher education regulators may consider developing sector-specific sustainability reporting guidelines for universities. Standardized guidelines could help improve the consistency and comparability of sustainability disclosures across higher education institutions.

Third, universities should take advantage of digital technologies by improving the accessibility and organization of sustainability information on their websites. Effective web-based communication can strengthen stakeholder engagement and enhance the visibility of sustainability initiatives undertaken by universities.

5.4 Limitations of the Study

Despite its contributions, this study has several limitations that should be considered when interpreting the findings. First, the analysis focuses exclusively on sustainability disclosures available on university websites, which may not fully represent all sustainability activities carried out by the institutions. Some sustainability initiatives may be communicated through other channels such as annual reports, sustainability reports, or social media platforms.

Second, the findings reflect the specific time period of data collection, and website content may change over time as universities update their sustainability information. As a result, the findings provide a snapshot of

sustainability disclosure practices during the observation period rather than capturing long-term trends.

Finally, the study is limited to Malaysian universities, which may restrict the generalizability of the findings to other higher education contexts or countries.

5.5 Directions for Future Research

Future research could extend this study in several ways. First, researchers may conduct longitudinal studies to examine how sustainability reporting practices evolve over time as universities increasingly adopt sustainability initiatives and digital communication platforms.

Second, future studies could expand the research context by comparing sustainability reporting practices across different countries or regions, particularly within Southeast Asia. Comparative studies may provide broader insights into how institutional, cultural, and regulatory factors influence sustainability disclosure in higher education.

Third, future research could incorporate additional data sources, such as sustainability reports, annual reports, interviews with university management, or surveys of stakeholders. These approaches may provide a deeper understanding of the motivations, challenges, and impacts associated with sustainability reporting in universities.

Finally, further research may explore the relationship between sustainability reporting and institutional performance, stakeholder engagement, or university reputation, thereby enriching the literature on sustainability communication and accountability in higher education institutions.

Acknowledgment

This research was funded by the Ministry of Higher Education (MOHE) of Malaysia under the Fundamental Research Grant Scheme (FRGS) with the reference number FRGS/1/2020/SS0/USIM/02/7.

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