

Assessing the need for a nature guide role assessment inventory: a case study from Taman Negara Pahang, Malaysia

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ABSTRACT

In delivering meaningful ecotourism experiences, nature guides play a crucial role in environmental interpretation, conservation advocacy, visitor management, and visitor engagement. However, there is currently no validated and comprehensive instrument specifically designed to assess the professional roles of nature guides in Malaysian ecotourism settings. Therefore, this study aimed to establish the empirical need for developing a Nature Guide Role Assessment Inventory (NGRAI) to support competency evaluation, professional development, quality assurance, and certification practices among licensed nature guides. Guided by McKillip's (1987) Discrepancy Model of Needs Analysis, a quantitative needs-analysis survey was conducted among 30 licensed Local Nature Tourist Guides operating in Taman Negara Pahang, Malaysia. The findings demonstrated strong consensus among respondents regarding the difficulty of identifying suitable instruments and models for evaluating nature-guide roles. Support for developing a dedicated role-assessment instrument was also substantial, with 96.7% of respondents agreeing that such an instrument would be beneficial and 93.4% agreeing that its development is necessary. The findings provide practitioner-based empirical evidence supporting the need for a dedicated role-assessment instrument and establish an empirical foundation for the subsequent development and validation of the NGRAI. The study contributes to the professionalization of nature guiding and supports Sustainable Development Goal 9 (Industry, Innovation and Infrastructure) through innovation in competency

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assessment and professional development systems within the Malaysian ecotourism sector.

1. INTRODUCTION

Ecotourism has emerged as a major, rapidly expanding sector within the global tourism industry, contributing to environmentally responsible travel experiences that emphasize conservation, cultural understanding, and community involvement (Chandel & Kanga, 2020). It is defined as low-impact, nature-based travel to relatively undisturbed areas, with an educational and interpretive component that promotes appreciation of natural and cultural heritage while supporting the sustainable development of host communities. This sector is crucial to Malaysia's efforts to advance biodiversity conservation and boost rural economies. Due to its rich tropical rainforests, unique flora and animals and protected national parks, Malaysia has become one of the top ecotourism sites in Southeast Asia.

The National Ecotourism Plan 2016–2025 describes a strategic path to improve sustainable tourism by empowering local communities and protecting natural resources (Ministry of Tourism, Arts and Culture, 2016). Ecotourism succeeds in this setting, primarily thanks to the nature guides, sometimes known as local ecotourism guides or environmental interpreters. They provide interpretive services that encourage responsible behaviour and foster visitors' environmental awareness, which are the primary interactions between tourists and natural environments (Black & King, 2002; Weiler & Davis, 1993). Their responsibilities include transferring information, mediating cultural aspects, advocating conservation and providing logistical leadership. Demand is increasing for competent guides who can balance environmental sensitivity with high-quality visitor experiences as ecotourism becomes more complex (Ali, Isa, Isa, & Isa, 2021; Yılmaz, Özsoy, & İli, 2025).

Given the pivotal role that nature guides play in shaping visitors' experiences, promoting environmental stewardship, ensuring visitor safety, and facilitating cultural understanding, evaluating their professional performance has become increasingly important in ecotourism management. Systematic assessment enables tourism stakeholders to identify competency gaps, improve training effectiveness, strengthen certification standards, and ensure the consistent delivery of high-quality interpretive services. Furthermore, evaluating the professionalism of nature guides is essential to supporting sustainable tourism objectives, as guides directly influence visitors' environmental awareness, responsible behaviour, and overall satisfaction with ecotourism experiences (Black & Ham, 2005; Weiler & Black, 2015). As ecotourism destinations continue to attract increasingly diverse visitors and operate within environmentally sensitive protected areas, nature guides are expected to fulfil increasingly complex responsibilities that extend beyond environmental interpretation to include visitor management, safety, conservation advocacy, and the promotion of responsible visitor behaviour. Recent studies have further demonstrated that the

quality of nature guides' interpretation and professional performance can significantly influence visitors' pro-environmental behaviour and contribute to more sustainable tourism experiences in protected areas (Alzghoul, Jamaliah, Alazaizeh, Mgonja, & Al-Daoud, 2024; Moscardo & Hughes, 2023). Without a structured assessment mechanism, however, efforts to evaluate guide competency, identify professional development needs, and ensure consistent standards of guiding practice remain largely subjective and fragmented.

Several instruments have been developed to assess selected dimensions of tour-guiding performance. For example, Teng and Tsaur (2022) developed a Charismatic Tour-Guiding Scale that focuses on leadership and motivational communication attributes, while Cheng, Chen, and Wu (2021) introduced a scale measuring tour guide playfulness through humour, spontaneity, and creativity. Similarly, Tsaur and Tu (2019) proposed a framework for evaluating cultural competence among tour leaders, while Kapa, de Crom, and Hermann (2022) identified clusters of ethical, professional, and cognitive competencies associated with memorable tourist experiences. Although these instruments contribute valuable insights into specific aspects of guiding performance, they primarily assess isolated competencies and were largely developed within general tourism contexts. They do not provide an integrated framework that captures the multifaceted roles of nature guides, including environmental interpretation, conservation advocacy, visitor management, cultural mediation, and safety responsibilities within ecotourism settings. In the Malaysian context, Sulaiman and Isa (2020) further highlighted the absence of a validated instrument specifically designed to assess these diverse roles. This limitation creates challenges for research, training, certification, and quality assurance efforts. Therefore, there is a clear need to develop a comprehensive, context-specific instrument to systematically evaluate the professional roles and responsibilities of nature guides in ecotourism destinations.

The development of a valid assessment instrument is widely recognized as a systematic process that begins with establishing the need for a new measure before proceeding to item generation, expert review, and psychometric validation (DeVellis, 2017; Boateng, Neilands, Frongillo, Melgar-Quinonez, & Young, 2018). Consequently, establishing empirical evidence for the need for a context-specific nature guide role-assessment instrument represents a critical first step in the instrument development process. The proposed Nature Guide Role Assessment Inventory (NGRAI) is envisioned as a comprehensive instrument for systematically assessing the professional roles and responsibilities of licensed nature guides to support competency evaluation, professional development, quality assurance, and certification practices within Malaysian ecotourism. Accordingly, this study aims to determine the need for such an instrument by examining licensed nature guides' perceptions of the availability, adequacy, and necessity of role-assessment tools in Malaysian ecotourism settings. Guided by McKillip's (1987) Discrepancy Model of Needs Analysis and situated within the first phase of the modified Design and Development Research (DDR) approach (Saedah et al., 2020), the study seeks to provide empirical justification for the subsequent development of the Nature Guide Role Assessment Inventory (NGRAI).

To achieve this aim, the study makes several theoretical and practical contributions to ecotourism and tourism-guiding literature. First, it provides empirical evidence regarding the need for a dedicated nature guide role assessment instrument within the Malaysian context. Second, it extends the application of McKillip's (1987) needs analysis framework to the assessment of professional competencies in ecotourism. Third, it establishes the foundational needs-analysis phase required for the future development and

validation of the NGRAI under the DDR framework. Practically, the findings may assist policymakers, training institutions, and tourism stakeholders in strengthening competency development, certification systems, and professional standards for nature guides. In doing so, the study has the potential to support broader sustainable development agendas, particularly SDG 9 (Industry, Innovation and Infrastructure) through innovation in human capital development and professional systems, SDG 4 (Quality Education) through the identification of competency development needs, and SDG 8 (Decent Work and Economic Growth) through efforts to enhance the professional recognition and capacity of nature guides operating in ecotourism destinations.

2. LITERATURE REVIEW

2.1 Understanding Nature Guides in Ecotourism

Nature guides, also known as local nature guides, ecotourism guides, or environmental interpreters, are individuals who are competently trained to accompany visitors through natural and protected areas, provide environmental interpretation, ensure visitor safety, and facilitate meaningful nature-based experiences that foster environmental appreciation, cultural understanding, and responsible behaviour (Black & King, 2002; Weiler & Davis, 1993). They act as educators, mediators, conservationists, stewards of ecological and cultural resources, and facilitators of outdoor excursions. Their primary objectives are to actively support sustainable tourism development and to improve the visitors' experiences.

Nature guides are accountable for numerous interconnected tasks. Primarily, they are responsible for environmental education, helping tourists understand the biological, ecological, and geological significance of destinations they visit (Ham & Weiler, 2002). Nature guides help visitors develop emotional and cognitive bonds with nature through interpretive storytelling, demonstrations, and thematic explanations. Secondly, they play an essential role in visitor management, group safety, monitoring visitors' behaviour, and minimizing ecological disturbance during tours. Nature guides regularly employ best practices for low-impact travel to protect the fragile ecosystems from the potentially harmful impacts of tourism (Black & King, 2002). Third, by integrating environmental stewardship lessons into visitors' experiences, nature guides serve as advocates for conservation actions. They encourage visitors to support or participate in global environmental protection initiatives by showcasing conservation challenges and success stories (Ali et al., 2021). Fourth, nature guides serve as cultural mediators, helping tourists understand and honour the local community's customs, values and behaviours. Guides are vital for promoting respect and understanding between cultures in places where ecotourism relies heavily on indigenous knowledge and cultural landscapes (Lian Chan & Baum, 2007).

Given these diverse responsibilities, nature guides play a critical role in delivering ecotourism outcomes and supporting the sustainability objectives of ecotourism destinations. Their effectiveness influences visitors' environmental awareness, responsible behaviour, safety, and overall experience, while also contributing to conservation and community-development efforts (Syakier & Hanafiah, 2021; Weiler & Black, 2015). As a result, the competencies, behaviours, and guiding approaches of nature guides have important implications for the ecological, sociocultural, and economic sustainability of tourism destinations. This highlights the importance of professional development and systematic evaluation of

guide competencies to ensure that nature guides can effectively fulfil their multiple roles within ecotourism settings. Given their direct involvement in performing and reflecting on these professional responsibilities, nature guides themselves represent a key stakeholder group for evaluating the adequacy of existing competency and role-assessment approaches within ecotourism settings. Their perspectives are therefore valuable in identifying assessment needs and informing the development of context-specific evaluation instruments.

2.2 Previous Studies on Tour Guide Competencies

Over the past two decades, research has consistently highlighted the importance of guide competencies in influencing visitor experiences, satisfaction, and behavioural outcomes across various tourism settings. Effective guiding has been associated with a broad range of competencies, including communication skills, destination knowledge, leadership abilities, customer service, ethical conduct, and cultural mediation (Ap & Wong, 2001; Zhang & Chow, 2004; Huang, Hsu, & Chan, 2010; Weiler & Walker, 2014). Collectively, these studies suggest that guiding is a multidimensional profession that requires integrating interpersonal, professional, and interpretive competencies to meet visitor expectations and support sustainable tourism objectives.

Building on this understanding, researchers have developed various approaches to assess specific dimensions of guide performance and competence. For example, charismatic leadership has been examined in terms of attributes such as enthusiasm, self-confidence, and motivational communication, which have been shown to enhance visitor engagement and tour satisfaction (Teng & Tsaur, 2022). Similarly, guide playfulness has been assessed through humour, spontaneity, and creativity, with findings indicating positive effects on tourists' emotional engagement and memorable experiences (Cheng et al., 2021). Other studies have focused on intercultural competence, emphasizing guides' ability to facilitate interactions among culturally diverse visitor groups and mediate cross-cultural understanding (Tsaur & Tu, 2019). More comprehensive competency frameworks have identified broader domains, including ethical attributes, professional abilities, and cognitive skills such as reliability, customer service, destination knowledge, and time management (Kapa et al., 2022). Together, these studies have contributed significantly to understanding the competencies associated with effective guiding and have provided valuable dimensions for competency assessment.

Despite these contributions, existing assessment approaches remain fragmented. Most instruments focus on specific competency dimensions or personal attributes rather than evaluating the integrated responsibilities that guide performance in practice. While competency studies have identified important characteristics of effective guides, relatively few studies have developed validated instruments to systematically assess the full range of guiding roles. This limitation is particularly evident in ecotourism settings, where nature guides are expected to simultaneously perform functions related to environmental interpretation, conservation advocacy, visitor safety, cultural mediation, and resource stewardship (Weiler & Black, 2015). Consequently, competency models developed in general tourism or sightseeing contexts may not adequately capture the complexity of nature-guiding responsibilities.

In Malaysia, research on nature-guide competencies remains relatively limited. Sulaiman and Isa (2020) highlighted the diverse roles performed by nature guides and acknowledged the lack of a validated instrument to systematically assess these responsibilities. More recently, Ahmad, Nazari, Suhaimi, Ismail, & Zainal (2025) identified local nature guides as a key strength of tourism offerings in Taman Negara

Pahang while also noting shortcomings in professional development and management frameworks within the ecotourism sector. These findings suggest a need for more structured approaches to competency evaluation and professional development. Therefore, although previous studies have expanded the understanding of the competencies required for effective guiding, there remains a need for a comprehensive, context-specific instrument to assess the multidimensional roles of nature guides in ecotourism destinations. This gap provides the rationale for developing the NGRAI.

2.3 Gaps in Existing Measurement Tools

While previous studies have identified a wide range of guide competencies, less attention has been given to how these competencies can be systematically measured through comprehensive assessment instruments. Existing tools generally focus on specific competency dimensions, such as leadership, playfulness, cultural competence, communication effectiveness, or professional skills, rather than providing a comprehensive assessment of guide performance. Consequently, while these instruments offer valuable insights into specific aspects of guiding, they are limited in their ability to capture the multidimensional nature of guide responsibilities.

Recent studies increasingly support the need for multidimensional assessment approaches. For example, Sulaiman Al Jahwari, Sirakaya-Turk, and Altintas (2016) identified six communication-related performance domains and reported significant discrepancies between the perceived importance and actual performance of these competencies. Similarly, Anđelković et al. (2022) proposed five distinct guide-performance profiles comprising technical skills, emotional intelligence, and personal attributes, while Kapa et al. (2022) identified ethical, professional, and cognitive competency domains. Harara, Al Najdawi, Rababah, and Haniyi (2024) further highlighted the importance of language ability, assertiveness, interpersonal inclusion, attentiveness, and approachability in guiding effectiveness. Collectively, these studies demonstrate that guide performance encompasses multiple interrelated dimensions that cannot be adequately assessed through single-trait or narrowly focused instruments. To further illustrate the scope and limitations of existing assessment approaches, Table 1 compares the primary dimensions covered by selected guide assessment instruments and highlights the distinctive focus of the proposed NGRAI.

Table 1. Comparison of Existing Guide Assessment Instruments, Their Dimensions, and Identified Limitations

Study	Instrument/Focus	Main Dimensions	Limitation
Teng & Tsaor (2022)	Charismatic Leadership	Enthusiasm, self-confidence, motivational communication	Leadership-focused
Cheng et al. (2021)	Playfulness	Humour, spontaneity, creativity	Personality-focused
Tsaor & Tu (2019)	Cultural Competence	Intercultural sensitivity, cultural mediation	Cultural-focused
Kapa et al. (2022)	Competency Framework	Ethical, professional, and cognitive competencies	General tourism context
Harara et al. (2024)	Guide Performance	Language ability, inclusion, attentiveness	Not ecotourism-specific
The proposed NGRAI	Nature Guide Roles	Interpretation, conservation, safety, cultural mediation, stewardship	Ecotourism-specific

Beyond the issue of fragmented competency assessment, existing instruments also demonstrate limited contextual applicability to ecotourism settings. Despite recognizing the multidimensional nature of guiding, most assessment approaches have been developed within general tourism, cultural tourism, or sightseeing

contexts. As a result, they pay limited attention to the distinctive responsibilities of nature guides operating in ecotourism environments. Unlike conventional tour guides, nature guides are expected to simultaneously serve as environmental interpreters, conservation advocates, visitor safety personnel, cultural mediators, and resource stewards. These responsibilities require an integrated assessment framework that can evaluate multiple role dimensions within a single instrument.

The limitations of existing instruments are particularly evident in the Malaysian context. Sulaiman and Isa (2020) highlighted the lack of a validated tool for systematically assessing the diverse roles that nature guides perform in ecotourism destinations. Similarly, Ahmad et al. (2025) emphasized the need for stronger professional development and management frameworks for local nature guides. Without context-specific assessment instruments, efforts to improve training, certification, performance evaluation, and quality assurance remain constrained.

Therefore, while existing studies provide valuable guidance on the competencies required for effective guiding, a significant gap remains in the availability of a comprehensive instrument designed to assess the integrated roles of nature guides in ecotourism settings. Addressing this gap requires developing a context-specific NGRAI to systematically evaluate nature guides' environmental, cultural, safety, and visitor-engagement responsibilities. Given the identified gap between existing assessment approaches and the multidimensional roles expected of nature guides, a systematic needs assessment is required before developing a new instrument.

2.4 Theoretical Framework: McKillip's Discrepancy Model

The present study is guided by McKillip's (1987) Discrepancy Model of Needs Assessment, which defines a need as the gap between an existing condition and a desired condition. According to this model, needs assessment involves identifying discrepancies between current practices and expected standards to determine whether intervention or development is required. The model has been widely applied in educational, professional, and organizational settings to justify the development of new programs, systems, and assessment instruments.

In the context of ecotourism, the desired condition is the availability of a comprehensive, context-specific instrument that can systematically assess the diverse roles and responsibilities of nature guides. However, the literature reviewed in the preceding sections indicates that existing assessment approaches remain fragmented, focusing primarily on isolated competencies such as leadership, communication, cultural competence, or personal attributes. Furthermore, few instruments have been specifically designed to assess the integrated roles of nature guides operating within ecotourism settings. This situation suggests a discrepancy between current assessment practices and the assessment needs of effective nature-guiding performance.

Applying McKillip's (1987) Discrepancy Model enables the study to examine the extent to which licensed nature guides perceive a need for a comprehensive instrument to evaluate their professional roles and responsibilities in Malaysian ecotourism settings. The conceptual basis of the needs-analysis process is illustrated in Figure 1.

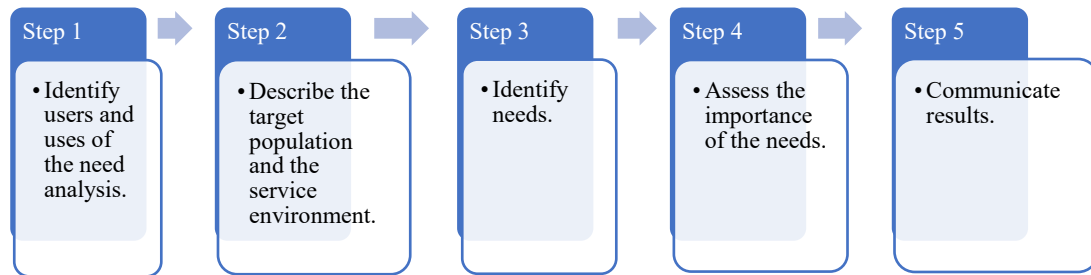


Fig. 1: McKillip's (1987) Discrepancy Model of Needs Assessment

Source: McKillip (1987)

3. METHODOLOGY

3.1 Research Design

This study employed a quantitative needs-analysis survey design to examine licensed nature guides' perceptions regarding the availability of existing approaches for assessing their professional roles and responsibilities, as well as the need for a dedicated role-assessment instrument within Malaysian ecotourism settings. Guided by McKillip's (1987) Discrepancy Model of Needs Assessment, the study sought to identify perceived gaps between current assessment practices and the need for a comprehensive instrument to evaluate nature guides' professional roles and responsibilities. Rather than evaluating the professional roles themselves, the study examined stakeholders' perceptions of whether existing assessment instruments and models adequately support such evaluation and whether there is a need to develop a dedicated role-assessment inventory. The Discrepancy Model, therefore, provided the analytical framework for identifying perceived assessment needs by comparing the current state of assessment practice with the desired state of having a comprehensive, context-specific instrument. By examining these perceived discrepancies, the study provides empirical evidence to justify the future development of the NGRAI within the DDR framework.

Although the conceptual basis of McKillip's (1987) Discrepancy Model is presented in the literature review, its operationalization within the present study is summarized in Table 2. The five stages of the model guided the systematic implementation of the needs analysis, from identifying the target stakeholders and assessing the current assessment situation to determining the perceived need for a dedicated role-assessment instrument and providing empirical justification for the subsequent development of the NGRAI.

Table 2. Operationalization of McKillip's (1987) Discrepancy Model of Needs Assessment in the Present Study

McKillip's Discrepancy Model Stage	Application in the Present Study
Step 1: Identify users and uses of the needs analysis	The primary stakeholders comprised licensed Local Nature Tourist Guides. The findings are intended to inform researchers, the Ministry of Tourism, Arts and Culture (MOTAC), park management authorities, training providers, and certification bodies regarding the need for a dedicated role-assessment instrument.

Step 2: Describe the target population and service environment	The study focused on licensed Local Nature Tourist Guides operating in Taman Negara Kuala Tahan, Pahang, representing experienced practitioners within a Malaysian ecotourism destination.
Step 3: Identify needs	Respondents evaluated the availability and adequacy of existing assessment instruments and models and expressed their perceptions regarding the need for a dedicated Nature Guide Role Assessment Inventory (NGRAI).
Step 4: Assess the importance of the needs	The importance of the identified needs was assessed using percentage agreement and the Interquartile Range (IQR) to determine the level of consensus among the participating licensed Local Nature Tourist Guides.
Step 5: Communicate results	The findings provide empirical justification for proceeding to the subsequent stages of NGRAI development within the Design and Development Research (DDR) framework.

3.2 Population and Sampling

The target population for this study comprised licensed Local Nature Tourist Guides (LNTGs) operating in Taman Negara Pahang, one of Malaysia's premier ecotourism destinations. In Malaysia, Local Nature Tourist Guide licences are issued by the Ministry of Tourism, Arts and Culture (MOTAC) to individuals who have successfully completed the prescribed training programme and fulfilled the Ministry's certification requirements. As certified professionals, LNTGs are authorized to conduct guided nature-based tourism activities within designated ecotourism destinations. They were selected because they are the primary stakeholders directly involved in environmental interpretation, visitor management, conservation advocacy, and cultural mediation within ecotourism settings. Their professional experience provides first-hand insight into the adequacy of existing assessment approaches and the need for a dedicated role-assessment instrument.

A purposive sampling technique was employed to recruit respondents who possessed the specific knowledge and experience required to evaluate the study's focus. To be included in the study, respondents were required to hold a valid Local Nature Tourist Guide licence issued by MOTAC and be actively involved in guiding activities within the study area. These criteria ensured that all responses were grounded in current professional practice and direct experience in ecotourism operations.

A total of 31 eligible Local Nature Tourist Guides participated in the study, of whom 30 completed the questionnaire, yielding a response rate of 96.8%. Although the total population of licensed Local Nature Tourist Guides in Pahang is considerably larger, the purpose of this study was not to achieve statistical generalization but to conduct a focused needs analysis among practitioners with specialized professional expertise. As noted by Israel (1992), purposively selected samples are appropriate for exploratory and instrument-development studies when respondents possess relevant domain knowledge. Therefore, the sample was considered adequate for identifying stakeholder perceptions regarding the need for the NGRAI.

3.3 Research Instrument and Validation

Data were collected using a structured questionnaire comprising two sections (Table 3). Section A gathered respondents' demographic information, including race, highest level of education, primary guiding location, employment status, monthly income, and years of guiding experience. Section B consisted of four needs-assessment statements developed to examine respondents' perceptions regarding the availability of existing assessment instruments, the adequacy of current assessment models, the usefulness of a dedicated

role-assessment instrument, and the need to develop such an instrument. Responses were measured using a five-point Likert scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree).

Table 3. Needs-Assessment Survey Items

Section	Item	Question
A (Demographic)	1	Race
	2	Highest education level
	3	Main location to conduct the activity of guiding
	4	Work status
	5	Monthly income
	6	Experience as a guide
B (Need analysis)	1	"Finding a valid instrument to evaluate the roles of nature guides in guiding trips is difficult."
	2	"It is difficult to find a valid model for planning guided trips that focuses on the roles of nature guides."
	3	"It would be helpful to have an instrument to measure it."
	4	"It is a call now to develop a specific instrument focused on the roles of nature guides."

The questionnaire was developed specifically for this exploratory needs-analysis study based on the research objectives and informed by the literature on nature guide competencies, ecotourism practices, and established principles of instrument development (DeVellis, 2017; Boateng et al., 2018). As recommended in the early stages of instrument development, expert review was undertaken to ensure that the questionnaire adequately reflected the study objectives and was appropriate for the intended respondents before field administration.

To establish face and content validity, the questionnaire was independently reviewed by two subject-matter experts with expertise in tourism and ecotourism research, including experience in professional nature guide training and development. Their evaluation focused on the relevance, clarity, wording, and alignment of each questionnaire item with the study objectives. Based on their recommendations, minor revisions were made to improve the wording and overall comprehensibility of the questionnaire. As the questionnaire comprised four straightforward needs-assessment statements intended for exploratory needs analysis rather than psychometric scale validation, qualitative expert review was considered appropriate. Consequently, formal content validity indices such as the Content Validity Index (CVI) or Content Validity Ratio (CVR) were not computed.

Following the content validation process, the questionnaire was translated from English into the Malay Language to facilitate respondents' understanding. To ensure semantic equivalence between the two language versions, a back-translation procedure (Brislin, 1970) was employed. The translation and back-translation were independently reviewed by two language experts, one specializing in Teaching English as a Second Language (TESL) and the other in Malay Language Education, each with more than 15 years of teaching experience. Their review focused on linguistic accuracy, semantic equivalence, and conceptual consistency between the English and Malay language versions. Minor refinements were subsequently made to improve language clarity while preserving the intended meaning of each questionnaire item.

3.4 Data Collection Procedure

Data collection was conducted during a Continuing Tourism-Related Education (CTRE) programme held in July 2024 and jointly organized by Universiti Putra Malaysia and the Habitat Foundation. Prior to questionnaire administration, respondents were informed of the study's purpose and assured that their participation was voluntary. The questionnaires were distributed to eligible participants who met the study's inclusion criteria.

Respondents were given sufficient time to complete the questionnaire and were allowed to seek clarification if required. Completed questionnaires were collected immediately after completion to minimize non-response and missing data. Of the 31 eligible participants who attended the programme, 30 returned complete questionnaires, yielding a response rate of 96.8%.

3.5 Data Analysis

Data analysis was conducted in two stages. First, descriptive statistics, including frequencies and percentages, were used to summarise respondents' demographic characteristics.

Second, the needs-assessment items were analyzed to determine the level of consensus among licensed Local Nature Tourist Guides regarding the need for a role-assessment inventory. Given that the study employed purposive sampling involving licensed Local Nature Tourist Guides with specialized professional knowledge and experience, the analysis focused on examining the extent of consensus among this group of key stakeholders rather than making statistical generalizations to a wider population. Because the purpose of needs analysis is to identify shared perceptions among relevant stakeholders, consensus measurement was considered more appropriate than relying solely on measures of central tendency. Two indicators were therefore employed: percentage agreement and interquartile range (IQR).

A minimum agreement threshold of 70% was established to indicate consensus among respondents. The IQR was selected specifically to assess the strength and consistency of agreement among the participating licensed nature guides by measuring the dispersion of responses around the median. It is a robust measure for ordinal Likert-scale data and has been widely applied in needs assessment and consensus studies (Jubri et al., 2019; Von der Gracht, 2012). The combination of percentage agreement and IQR enabled the study to evaluate both the degree of agreement and the consistency of respondents' responses within this specific group of key stakeholders. The interpretation of consensus levels based on IQR values is presented in Table 4.

Table 4. The interquartile range level of consensus

Level of consensus	Score	Result
High consensus	0-1	Accepted
Moderate consensus	1.01-1.99	Accepted
No consensus	2.0 and above	Rejected

Source: Jubri et al., 2019

4. RESULTS OF THE NEEDS SURVEY

4.1 Demographic profile of the respondents

Table 5 presents the sociodemographic characteristics of the 30 licensed local nature guides who participated in the study. The respondents were predominantly Malay (90.0%), with smaller representations

from Chinese (6.7%) and Orang Asli (3.3%) communities. The sample was overwhelmingly male (96.7%) and generally possessed secondary-level education (86.7%). In terms of experience, 50.0% of respondents had less than 5 years of guiding experience, while 40.0% had more than 10 years, indicating a mix of relatively new and experienced guides in the sample. Most respondents reported monthly incomes below RM2,500, reflecting the modest economic profile commonly associated with nature-based tourism occupations.

Table 5. Sociodemographic profile of the respondents (n=30)

Item		Frequency	Percentage (%)
Age	18 – 24 years old	6	20.0
	25 – 34 years old	7	23.3
	35 – 44 years old	8	26.7
	45 – 54 years old	4	13.3
	55 years old and above	5	16.7
Race	Malay	27	90.0
	Chinese	2	6.7
	Others	1	3.3
Gender	Male	29	96.7
	Female	1	3.3
Education level	No formal education	1	3.3
	Primary school	3	10.0
	Secondary school	26	86.7
Monthly income	<RM1,500	14	46.7
	RM1,501 - RM2,500	15	50.0
	RM2,501 - RM3,500	1	3.3
Years of experience	Below 5 Years	15	50.0
	5 - 10 years	3	10.0
	10 years and above	12	40.0

4.2 Need Survey Results

Table 6 presents respondents' perceptions regarding the availability of existing assessment instruments and models, as well as their views on the need for a dedicated instrument to assess the roles of nature guides. The findings indicate strong agreement among respondents on the need for a dedicated instrument to assess nature guides' roles. A total of 80.3% of respondents agreed that finding a valid instrument to evaluate nature guide roles is difficult, while 90.0% agreed that identifying a valid model for planning guided trips that adequately reflects nature guide roles is difficult. These findings suggest that respondents perceive challenges in identifying assessment approaches that adequately address their professional roles in ecotourism settings.

Table 6. Respondents' Perceptions of the Need for a Nature Guide Role Assessment Inventory (NGRAI)

Statement	% Agreement	IQR	Mean	SD	Consensus Status
Finding a valid instrument to evaluate nature guide roles is difficult.	80.3%	1.25	3.43	1.17	Consensus Achieved
It is difficult to find a valid model for planning guided trips focusing on nature guide roles.	90.0%	1.00	3.33	0.88	Consensus Achieved
It would be helpful to have an instrument to measure the roles of nature guides.	96.7%	1.25	4.03	0.99	Consensus Achieved

It is a call now to develop a specific instrument focused on nature guide roles.	93.4%	1.00	4.27	0.98	Consensus Achieved
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*Percentage agreements (>70%)

*Interquartile Range (IQR < 1.99)

Support for developing a dedicated assessment instrument was even stronger. A total of 96.7% of respondents agreed that having a specific instrument to assess nature guide roles would be beneficial, while 93.4% agreed that there is a need to develop a dedicated instrument focused on nature guide roles. Both statements showed high levels of agreement and acceptable IQRs, indicating consistent consensus among respondents.

Overall, all four statements exceeded the predetermined agreement threshold of 70% and recorded IQR values below 1.99, indicating moderate to high consensus among respondents. The results demonstrate a shared perception among licensed nature guides of the importance and necessity of a dedicated instrument to assess their professional roles and responsibilities in ecotourism settings.

5. DISCUSSION

The findings provide empirical evidence from licensed nature guides regarding the need for a dedicated role-assessment instrument within Malaysian ecotourism settings. While previous studies have identified a lack of standardized tools for evaluating the diverse roles and competencies of nature guides (Sulaiman & Isa, 2020), the present study extends this understanding by demonstrating that practising nature guides themselves have difficulty identifying suitable instruments and models to assess their professional roles. This contribution is important because the need for assessment tools has largely been discussed from academic and conceptual perspectives, whereas limited evidence has been obtained directly from practitioners operating in ecotourism destinations. As one of Malaysia's most established ecotourism destinations, Taman Negara Pahang provides a relevant context for examining these issues, as licensed guides at the site are actively involved in nature interpretation, visitor management, and conservation-related activities. Consequently, the findings offer valuable practitioner-based insights into the assessment needs of nature guides within ecotourism settings.

Several factors may explain why respondents perceived challenges in identifying suitable assessment approaches. Nature guides in ecotourism settings perform multiple responsibilities that extend beyond conventional tour guiding, including environmental interpretation, conservation advocacy, visitor management, safety supervision, and cultural mediation. These responsibilities require a combination of technical knowledge, communication skills, ethical conduct, and environmental stewardship. However, existing assessment approaches are often fragmented and focus on specific competencies rather than the overall role of nature guides. Consequently, practitioners may struggle to identify instruments that adequately reflect the full scope of their professional responsibilities. The absence of structured assessment frameworks may limit systematic training, performance evaluation, competency development, and quality assurance within the Malaysian ecotourism sector.

The strong support for developing a dedicated assessment instrument further reinforces the need for a more comprehensive framework tailored to ecotourism contexts. Nearly all respondents agreed that a dedicated instrument for assessing nature-guide roles would be beneficial and that its development is both necessary

and timely. These findings are consistent with previous studies highlighting the absence of structured evaluation tools for nature guides in Malaysia (Sulaiman & Isa, 2020) and the growing need for professionalization within the ecotourism sector (Ahmad et al., 2025; Ali et al., 2021). Unlike existing instruments that focus on individual competencies such as charisma, playfulness, cultural competence, or selected professional skills (Cheng et al., 2021; Kapa et al., 2022; Teng & Tsaur, 2022; Tsaur & Tu, 2019), the proposed assessment inventory, NGRAI, is intended to assess the broader roles performed by nature guides. Drawing on the literature, these role dimensions encompass environmental interpretation, visitor education, conservation advocacy, visitor and safety management, and cultural mediation, reflecting the multifaceted responsibilities consistently associated with professional nature guiding in ecotourism settings. By integrating these dimensions into a single framework, NGRAI has the potential to provide a more holistic approach to evaluating nature-guide performance in ecotourism settings. Such an approach may also facilitate more systematic competency assessment, inform professional development initiatives, and support greater consistency in training and certification practices across the Malaysian ecotourism sector. The present findings, therefore, establish the empirical foundation required before proceeding to the subsequent phases of NGRAI development, ensuring that the proposed inventory is grounded in practitioner-identified needs rather than assumptions derived solely from the literature (DeVellis, 2017; Boateng et al., 2018).

The findings also support the application of McKillip's (1987) Discrepancy Model as a framework for needs analysis. According to the model, needs emerge when stakeholders perceive a discrepancy between current conditions and desired conditions. In the present study, respondents reported difficulties in identifying suitable assessment instruments and models while simultaneously expressing strong support for the development of a dedicated role-assessment tool. This pattern reflects a perceived gap between existing assessment practices and the need for a comprehensive instrument to evaluate nature-guide roles in ecotourism settings. The high levels of agreement and acceptable consensus values indicate that this perceived need is widely shared among the respondents, thereby providing empirical justification for proceeding to the subsequent stages of instrument development, including item generation, expert review, and psychometric validation, consistent with established instrument-development frameworks (DeVellis, 2017; Boateng et al., 2018).

From a practical perspective, the findings highlight the importance of strengthening competency assessment and professional development within Malaysia's ecotourism sector. A structured role-assessment instrument may assist training providers, certification bodies, tourism authorities, and ecotourism operators in identifying competency gaps and supporting continuous professional development among nature guides. Although the study was conducted within a single ecotourism destination using a purposive sample, the findings may be transferable to similar protected-area and ecotourism settings where nature guides perform comparable interpretive, conservation, and visitor-management roles. Nevertheless, further studies involving broader geographical contexts would be beneficial during the subsequent development and validation stages of the NGRAI.

In conclusion, the findings provide empirical support for developing a dedicated NGRAI. By capturing the perspectives of licensed nature guides, the study confirms the perceived need for a structured assessment

framework and establishes a foundation for subsequent instrument-development efforts. Ultimately, such an instrument may strengthen professional practice, competency development, and quality assurance within Malaysia's ecotourism sector.

6. CONCLUSION AND IMPLICATIONS

This study established the empirical need for developing the NGRAI by examining licensed nature guides' perceptions of the availability, adequacy, and necessity of role-assessment instruments in Malaysian ecotourism settings. Guided by McKillip's (1987) discrepancy model of needs analysis, the findings revealed a strong consensus among respondents that suitable instruments and models for assessing nature guide roles are difficult to identify and that a dedicated assessment instrument is needed. These findings provide empirical support for a more systematic approach to evaluating the professional roles of nature guides in ecotourism destinations.

The study contributes to the ecotourism literature in several ways. First, it provides practitioner-based evidence regarding the perceived need for a specialized role-assessment instrument for nature guides in Malaysia. Second, it demonstrates the usefulness of McKillip's discrepancy model in identifying assessment needs within the context of professional competency evaluation. Third, the study establishes an empirical foundation for the future development of the NGRAI, particularly around role dimensions identified in the literature, including environmental interpretation, conservation advocacy, visitor management, cultural mediation, and visitor safety.

From a practical perspective, the findings may assist tourism authorities, training providers, and ecotourism operators in understanding current assessment gaps within the nature-guiding profession. Such information is valuable for guiding future competency development initiatives, certification systems, and professional standards to strengthen the quality and sustainability of ecotourism services.

The findings also have broader implications for sustainable development agendas. By establishing the empirical need for a context-specific nature guide role-assessment instrument, the study contributes to SDG 9 (Industry, Innovation and Infrastructure) by providing empirical justification for the future development of such an instrument within the Malaysian ecotourism sector.

Several limitations should be acknowledged. The study was conducted among licensed nature guides operating in Taman Negara Pahang using a purposive sampling approach, and therefore, the findings should be interpreted as transferable to similar ecotourism contexts rather than statistically generalizable to all nature guides in Malaysia. In addition, the study focused solely on the perceptions of nature guides and did not incorporate perspectives from other stakeholders such as visitors, tourism managers, or policymakers.

Future research should proceed with the subsequent stages of instrument development. Building upon the needs analysis findings, future studies should identify and operationalize the key dimensions of nature-guide roles, develop a pool of measurement items, and establish content validity through expert review. Subsequent validation procedures should include pilot testing, exploratory and confirmatory factor analyses, and reliability testing across different ecotourism settings to ensure the validity and applicability of the proposed NGRAI.

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8. CONFLICT OF INTEREST STATEMENT

The authors agree that this research was conducted without any self-benefit, commercial, or financial conflicts and declare no conflicts of interest with the funders.

9. AUTHORS' CONTRIBUTIONS

Mustakim Hashim: Conceptualization, methodology, formal analysis, investigation and writing-original draft; **Mohd Hafizal Ismail:** Conceptualization, methodology, supervision, writing- review and editing, and formal analysis; **Mohd Aswad Ramlan:** Conceptualization, supervision, writing- review and editing, formal analysis, and validation; **Muhammad Firdaus Jamaluddin:** Conceptualization, formal analysis, and validation.

10. DECLARATION OF GENERATIVE AI IN THE WRITING PROCESS

During the preparation of this work, the authors used Grammarly and QuillBot to perform grammar checking and proofreading. After using this tool/service, the authors reviewed and edited the content as needed and took full responsibility for the publication's content.

11. DATA AVAILABILITY/SUPPLEMENTARY MATERIALS

The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

12. REFERENCES

- Ahmad, Z., Nazari, N. M., Suhaimi, S. A., Ismail, J., & Zainal, I. (2025). Evaluating and improving tourist satisfaction: A holistic study of ecotourism services in Malaysia. *International Journal of Research and Innovation in Social Science*, 9(2), 3274-3284.
- Ali, A., Isa, S. S., Isa, S. S., & Isa, M. H. (2021). Ecotourism promotes conservation activity at tourism destinations: Limestone Forest Langkawi. *Environment-Behaviour Proceedings Journal*, 6(S16), 107-113.
- Alzghoul, Y. A., Jamaliah, M. M., Alazaizah, M. M., Mgonja, J. T., & Al-Daoud, Z. J. (2024). Tour guides' interpretation and tourists' pro-environmental behavior: differences across cultural and natural world heritage sites. *Journal of Ecotourism*, 23(3), 366-394.

- Andelković, Ž., Kovačić, S., Bratić, M., Vujičić, M. D., Stankov, U., Pavluković, V.,...Ivanović Bibić, L. (2022). Museum tour guide performance: a visitor perspective. *Sustainability*, 14(16), 10269.
- Ap, J., & Wong, K. K. (2001). Case study on tour guiding: Professionalism, issues and problems. *Tourism management*, 22(5), 551-563.
- Black, R., & Ham, S. (2005). Improving the quality of tour guiding: Towards a model for tour guide certification. *Journal of Ecotourism*, 4(3), 178-195.
- Black, R., & King, B. (2002). Human resource development in remote island communities: an evaluation of tour-guide training in Vanuatu. *International Journal of Tourism Research*, 4(2), 103-117.
- Boateng, G. O., Neilands, T. B., Frongillo, E. A., Melgar-Quinonez, H. R., & Young, S. L. (2018). Best practices for developing and validating scales for health, social, and behavioral research: a primer. *Frontiers in public health*, 6, 149.
- Brislin, R. W. (1970). Back-translation for cross-cultural research. *Journal of cross-cultural psychology*, 1(3), 185-216.
- Chandel, R. S., & Kanga, S. (2020). Sustainable management of ecotourism in western Rajasthan, India: A geospatial approach. *Geo Journal of Tourism and Geosites*, 29(2), 521-533.
- Cheng, T.-M., Chen, M.-T., & Wu, C.-H. (2021). Tour conductor playfulness: Conceptualising and scale development. *Journal of Travel Research*, 60(1), 197-207.
- DeVellis, R. F. (2017). *Scale Development: Theory and Applications* (4th ed.). Sage Publications.
- Goal 9: Build resilient infrastructure, promote sustainable industrialisation and foster innovation. United Nation. Retrieved 8 May from <https://www.globalgoals.org/goals/9-industry-innovation-and-infrastructure/>
- Ham, S. H., & Weiler, B. (2002). Interpretation as the centrepiece of sustainable wildlife tourism. *Chapter*, 3, 35-44.
- Harara, N. M., Al Najdawi, B. M., Rababah, M. A., & Haniyi, A. A. (2024). Jordanian tour guides' communication competency. *Journal of Language Teaching and Research*, 15(3), 873-883.
- Huang, S., Hsu, C. H., & Chan, A. (2010). Tour guide performance and tourist satisfaction: A study of the package tours in Shanghai. *Journal of Hospitality & Tourism Research*, 34(1), 3-33.
- Israel, G. D. (1992). Determining Sample Size. University of Florida, Institute of Food and Agricultural Sciences (IFAS), Extension PEOD-6.
- Jubri, J., Mohamad, S., Nashir, I. M., & Subri, U. S. (2019). Explored the constructs of teachers' teaching supervision in the subject of food services: The Application of the Modified Delphi Technique. *International Journal of Academic Research in Business and Social Sciences*, 9(6), 98-104.
- Kapa, M. G., de Crom, E. P., & Hermann, U. P. (2022). An exploration of tourist guides' competencies to create memorable tourist experiences. *GeoJournal of Tourism and Geosites*, 44(4), 1350-1358.
- Lian Chan, J. K., & Baum, T. (2007). Ecotourists' perception of ecotourism experience in lower Kinabatangan, Sabah, Malaysia. *Journal of Sustainable Tourism*, 15(5), 574-590.
- McKillip, J. (1987). *Need analysis- Tools for the human services and education* (1st ed.). SAGE Publications Inc.
- Ministry of Tourism and Culture Malaysia (2016). National Ecotourism Plan: 2016–2025. Universiti Teknologi Malaysia, & Tourism Planning Research Group (TPRG). Putrajaya: Kementerian Pelancongan dan Kebudayaan Malaysia.

- Moscardo, G., & Hughes, K. (2023). Rethinking interpretation to support sustainable tourist experiences in protected natural areas. *Journal of Interpretation Research*, 28(1), 76-94.
- Saedah, S., Muhammad Ridhuan, T. L. A., & Rozaini, M. R. (2020). *Pendekatan penyelidikan rekabentuk dan pembangunan (PRP): Aplikasi kepada penyelidikan pendidikan*. Tanjong Malim, Perak: Universiti Pendidikan Sultan Idris (UPSI).
- Sulaiman Al Jahwari, D., Sirakaya-Turk, E., & Altintas, V. (2016). Evaluating communication competency of tour guides using a modified importance-performance analysis (MIPA). *International Journal of Contemporary Hospitality Management*, 28(1), 195-218.
- Sulaiman, M. N. I., & Isa, S. S. (2020). Identifying tour guide's roles at ecotourism destination in Malaysia In M. Mariappan, E. L. A. Lin, S. Bidin, A. Zawawi, Z. A. Z. Abidin, & N. J. Jumaat (Eds.), *Ecotourism in Malaysia: Current Scenario* (pp. 164-171). Faculty of Forestry.
- Syakier, W. A., & Hanafiah, M. H. (2021). Tour guide performances, tourist satisfaction, and behavioural intentions: A study on tours in Kuala Lumpur City Centre. *Journal of Quality Assurance in Hospitality & Tourism*, 23(3), 597-614.
- Teng, H.-Y., & Tsaor, S.-H. (2022). Charismatic Tour-Guiding: Scale development and validation. *Journal of Travel Research*, 61(7), 1495-1507.
- Tsaor, S.-H., & Tu, J.-H. (2019). Cultural competence for tour leaders: Scale development and validation. *Tourism Management*, 71, 9-17.
- Von Der Gracht, H. A. (2012). Consensus measurement in Delphi studies: review and implications for future quality assurance. *Technological forecasting and social change*, 79(8), 1525-1536.
- Weiler, B., & Black, R. (2015). *Tour guiding research: Insights, issues and implications*. Multilingual Matters.
- Weiler, B., & Davis, D. (1993). An exploratory investigation into the roles of the nature-based tour leader. *Tourism Management*, 14(2), 91-98.
- Weiler, B., & Walker, K. (2014). Enhancing the visitor experience: Reconceptualising the tour guide's communicative role. *Journal of Hospitality and Tourism Management*, 21, 90-99.
- Yılmaz, N., Özsoy, A., & İli, N. D. (2025). Tour guide performance through the eyes of tourists: An analysis of user-generated reviews on Expedia. *Journal of Multidisciplinary Academic Tourism*, 10(1), 65-78.
- Zhang, H. Q., & Chow, I. (2004). Application of importance-performance model in tour guides' performance: Evidence from mainland Chinese outbound visitors in Hong Kong. *Tourism management*, 25(1), 81-91.



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