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# Assessment of Nautical Edutourism Determinants: A Study in Universiti Malaysia Terengganu

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*ABSTRACT*

The Ministry of Higher Education aims to implement the National Higher Education Strategic Plan beyond 2020, which includes the introduction of funding reforms. Given the projected significant growth, relying solely on additional public funding is not a viable long-term solution. Therefore, it is crucial to access and secure financial resources for the institution. Hence, this study aids in identifying the prospective facilities and expertise that can generate revenue for Universiti Malaysia Terengganu (UMT) as a case study through nautical edutourism. A digital survey was developed to collect data on the appeal, projected pricing, and tour results. The inquiries encompass the individual's experience, level of satisfaction, and recommendation regarding nautical edutourism. The online interview session was conducted with the assistance of authorities and experts to solicit their opinions on nautical edutourism at UMT and analyse it using the Analytic Hierarchy Process (AHP) method. The survey results indicate that Ship Simulator is the most appropriate primary attraction, followed by UMT Swimming Pool, RV Discovery, and Sailing Centre. The majority of respondents agreed that nautical edutourism can be a source of revenue for universities.

## 1. Introduction.

The Malaysian Federal Government, under the Ministry of Higher Education, has launched an initiative to implement the National Higher Education Strategic Plan beyond 2020, which includes the introduction of funding reforms. Undoubtedly, the Malaysian higher education sector has experienced significant growth and is projected to continue expanding by 2025. Given the projected significant growth, relying solely on increased public funding to sustain the sector is not a viable solution. The budget reductions occur at a crucial and opportune juncture, necessitating public universities to adapt to the prevailing standard. The deputy vice-chancellor for development collaborates with the business development unit to secure funding for the institution.

The deputy vice-chancellor for industry and community affairs strategically engages with external players from the industry and communities for academic and research collaborations. Since 2007, the funding for public universities has been significantly decreased to 70%, with 30% of the budget being financed by self-generated revenue. In 2016, the allocation of funds for higher education amounted to RM7.57 billion. However, in 2017, there was a significant decrease of 19.23%, resulting in a reduced budget of only RM6.12 billion (Doria, 2017). These budget reductions will undoubtedly have a significant impact on the operational capacity of universities and the overall quality of education they provide. The reduction in funding will pose challenges in obtaining government grants, which were already scarce at that time. This will undoubtedly make it difficult for university communities and young researchers to secure funding for their projects (Laird, 2020).

Hence, this study aims to assess the viability of Nautical Edutourism at Universiti Malaysia Terengganu and evaluate its income-generating potential for the university. This research will primarily focus on the Nautical Science facilities and ex-

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pertise available at Universiti Malaysia Terengganu.

### *1.1. Review of Study.*

In the past twenty years, the tourism industry and the education sector have experienced significant changes, resulting in the merging of these two industries. Educational tourism, also known as edutourism, is an emerging type of travel that involves recreational journeys undertaken primarily or partially for the purpose of study, self-enhancement, and intellectual stimulation. Educational tourism is a specific form of tourism that focuses on activities aimed at acquiring knowledge, learning, and education as the primary objective of the trip (Alipour et al., 2020).

Edutourism is a specialised branch of the tourism industry that primarily focuses on providing educational and learning experiences. It refers to a form of tourism in which a group of individuals travels to a destination outside their local area with the primary goal of gaining practical knowledge through firsthand experience. Tourists can also view it as an activity they undertake with the primary goal of acquiring knowledge during the journey. Edutourism activities typically include conferences, adult study tours, international and domestic studies, secondary school trips, and student exchange programs. Based on the aforementioned information, it is clear that the growth of tourism is dependent on the use of educational resources, which in turn create educational and learning opportunities, ultimately leading to the emergence of edutourism (McGladdery and Lubbe, 2017).

The term edutourism is currently a subject of debate among academics. This is because tourism typically involves temporarily leaving one's place of residence for recreational, educational, professional, or business purposes (Akhmedova, 2016). Nevertheless, there is a general consensus and widespread acknowledgement that edutourism is a highly appealing economic endeavour for numerous countries. It is a field that requires a significant amount of knowledge and provides long-lasting socio-economic advantages. Edutourism can improve knowledge dissemination and boost the global economy by promoting higher education as a valuable source of skilled individuals (Tomasi et al., 2020).

Nautical tourism is a form of tourism that encompasses coastal and maritime activities, serving as a common ground for the transport, tourism, and recreation sectors (Russo and Rindone, 2019). Nautical edutourism, a novel subject, had not been previously considered by anyone. This innovative concept, which merges nautical tourism and educational tourism, offers a distinctive form of travel that is bound to captivate individuals seeking to explore and deepen their knowledge of nautical studies.

Current research examines edutourism as a means to investigate international university education. This is because of its economic benefits to the countries hosting these universities, which is making it increasingly appealing as an export commodity or activity. Research on international universities is critical because of their large size and ability to generate export earnings. This study highlights the long-term advantages that these universities provide, which are of great value. Cross-border university education, which is a result of the edutourism industry, has become a lucrative multi-billion-dollar business for numerous countries and the global economy as a whole (Alipour et al., 2020).

Ortiz, Chang, and Fang (2015) project that the edutourism industry will attract 1,070,000 students by 2017. Additionally, we expect global expenditure on educational goods and services to rise from $4.4 trillion in 2012 to $6.2 trillion in 2017. The analysis of edutourism's economic impact revealed that the industry contributed to the employment of around 32,000 individuals in New Zealand in 2012, according to an infometrics study. Malaysia also contributes significantly to the export of university education services. In 2009, edutourism products alone contributed approximately US$6.6 billion, or four percent, of Malaysia's Gross National Income (GNI) (Bashir, 2007).

Nautical tourism is a significant sector of Europe's maritime economy, accounting for more than 33% of the blue economy. Within Europe, the boating industry encompasses approximately 36 million individuals who engage in regular boating activities. This sector consists of around 6 million boats and approximately 4,500 marinas, employing an estimated 40,000 to 70,000 individuals (Russo and Rindone, 2019). Marine tourism plays a significant role in Malaysia's tourism industry expansion. This presents a favourable occasion to acquaint the local population with the amalgamation of nautical tourism and educational tourism, as the marine sector and maritime sector share many similarities despite their differences. Researchers expect the implementation of nautical edutourism to significantly enhance our nation's economy in the future. When selecting educational tourism destinations, it is important to understand the critical factors that influence educational tourists' choices. Educational tourism has emerged as a significant component of the tourism industry. According to research, educational institutions can enhance their appeal to educational tourists by taking into account factors such as cost, accessibility, location, social aspects, and educational quality (Shneikat et al., 2021). An extensive examination of these factors would assist educational institution decision-makers in formulating more effective strategies to deliver desired services to educational tourists, as well as to attract and retain them (Shneikat et al., 2021). The cost is the primary factor in choosing an edutourism destination. However, the selection of variables to represent price is quite unsatisfactory. Individuals are actively seeking novel elements, fresh encounters, alternative societal standards, and diverse cultural practices.

Furthermore, Abubakar et al. (2014) conducted a study that revealed that twenty-three (**??**) participants ranked the quality of education as the second most significant criterion. They asserted that the opportunity to obtain superior education and access advanced scientific and technological resources was a significant driving force behind their decision to pursue studies overseas. Several prior studies were conducted to ascertain the factors that impact the demand for edutourism. The limited availability of higher education in numerous countries, especially in developing nations, has significantly driven students to migrate to other countries in the latter part of the twentieth

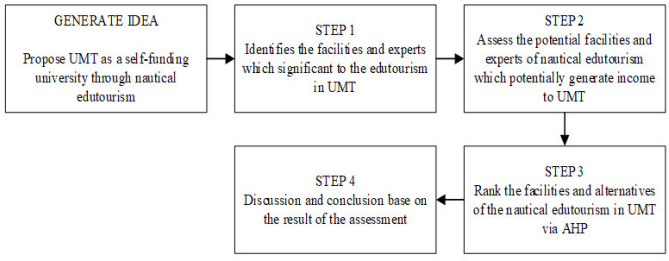
century (Lam et al., 2011). Hence, the criterion of ease of access also considers the criteria for edutourism. Harazneh et al. (2018) identified cost, cultural, political, and social factors as significant indicators after conducting a Kruskal-Wallis test on the enrolled programme. Due to labour market pressure, the focus has increased on cost, social, and political factors. Similarly, social referrals from acquaintances, family members, and social networks appear to be a crucial incentive as they decrease students' perceptions of risks (Lam et al., 2011). Once motivated to pursue international higher education, the previous studies show that students choose a specific country as their destination and then select a specific higher education institution within that country (Mazzarol and Soutar, 2002). The geographical location of the edutourism destination exerted a significant influence on the students' decision-making process.

## 2. Methodology.

This chapter of the research presents the methodologies, techniques, and approaches employed to gather data, encompassing the research framework, study area, data collection methods, and data analysis procedures. Essentially, to achieve the objectives, data will be collected through methods such as conducting a thorough site survey and interviewing experts.

### *2.1. Research Framework.*

Figure 1: Research Framework.




Source: Authors.

### *2.2. Data Collection.*

The data was predominantly gathered through the administration of an online questionnaire to the specific target demographics, which included teachers, government employees, and the general public. This questionnaire specifically addresses the importance of establishing nautical edutourism and identifying potential facilities that can attract visitors from outside. Prior to the collection of primary data, secondary data was acquired during the initial stages. This was accomplished by conducting a comprehensive literature review with the aim of comprehending the requirements for the development of novel forms of tourism in UMT. In addition, a literature review was conducted to ascertain the most effective approach for identifying hazards, based on the work of other researchers. Sources for the literature review encompass various mediums such as books, online databases, articles, journals, and news publications.

### *2.3. Data Analysis.*

Data analysis relies on the involvement of experts and the examination of relevant literature. The data required to ascertain the most effective approach for identifying potential facilities has been gathered through the use of questionnaires and expert involvement. The survey findings will subsequently be evaluated utilising the Analytical Hierarchy Process (AHP) method. AHP is a highly efficient tool for managing intricate decision-making processes, as it assists decision-makers in establishing priorities and arriving at optimal decisions. The process of breaking down intricate decisions into a sequence of pairwise comparisons, and subsequently combining them using the AHP, enables the consideration of both subjective and objective elements of decision-making (Saaty, 1990). This method involves organising all identified parameters into a hierarchical model by listing the main factors and sub-factors of the goals. In this study, the process of AHP consists of five distinct steps.

Step 1: Identify and decompose the problem.

The initial stage involves defining a decision problem and subsequently organizing it in a hierarchical manner. This is achieved by breaking down the decision problem into a series of interconnected decision elements, typically consisting of three levels: the objective level or goal, the main criteria level, and alternative.

Step 2: Construct a series of matrices for comparing pairs of elements.

The criterion was compared at an equivalent level, using a one-to-one basis, with groups formed based on identical elements for evaluation. The assessment was made based on the decision of experts who justified it using their experience and knowledge in the relevant subject areas. The questionnaire utilised the nine-point integer scaling assessment to conduct pair-wise comparisons between intangible criteria, as described by Saaty (2008). The main criteria matrix was created by evaluating the intensity of their respective pairs of criteria. The weight value assessment is organised in a matrix format. The attributes of ai and aj are represented as follows:

$$A = \left(a_{ij}\right) = \begin{bmatrix} 1 & a_{12} & \dots & a_{1n} \\ a/a_{12} & 1 & \dots & a_{2n} \\ . & . & \dots & . \\ 1/a_{1n} & 1/a_{2n} & \dots & 1 \end{bmatrix} \tag{1}$$

The items, represented by i and j where i and j are integers ranging from 1 to n, have attributes aij which respect the relationship between attribute ai and attribute aj.

Step 3: Determine the weight values of the criteria.

The weight values of the criteria determined through manual computation.

$$w_k = \frac{1}{n} \sum_{j=1}^{n} \left( \frac{a_{kj}}{\sum_{i=1}^{n} a_{ij}} \right) \tag{2}$$

The symbol *aij* represents the value located at the intersection of row i and column j in a comparison matrix of size n. The variable k ranges from 1 to n.

Step 4: Evaluate the coherence of all comparison matrices.

The AHP calculates a consistency ratio (CR) to assess the consistency of pair-wise comparisons. CR value below 0.1 indicates that the evaluation is consistent (Saaty, 1990). The λmax represents the highest eigenvalue of a comparison matrix A with dimensions n x n.

$$\lambda_{max} = \frac{\sum_{j=1}^{n} \frac{\sum_{k=1}^{n} w_k a_{jk}}{w_j}}{n} \quad (3)$$

In this context, wK represents the weight value assigned to a specific criterion, a jk represents the pair-wise criterion based on a specific row and column, and wj represents the weight value of the criterion. The Consistency Index (CI) is calculated using Equation 4.

$$CI = \frac{\lambda_{max} - n}{n - 1} \quad (4)$$

(n = 1, 2, 3, . . . , k, matrix size)

Next, the Consistency Ratio can be computed using Equation 5. The random index for the matrix size, A, denoted as RI, is dependent on the number of items being compared. The specific values for RI can be found in Table 1 (Saaty, 2008).

$$CR = \frac{CI}{RI} \quad (5)$$

Table 1: Random consistency index from 1-8 matrix size.

| n | 1 | 2 | 3 | 4 | 5 | 6 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|---|---|
| RI | 0 | 0 | 0.58 | 0.9 | 1.12 | 1.24 | 1.32 | 1.41 | 1.45 | 1.45 |

Source: Authors.

Step 5: Consolidate the ultimate priorities of the criteria.

The priority vectors obtained from the comparison matrices at each level are utilised in the last stage to assign weights to the priorities in the subsequent level. The process was iterated, and subsequently, all priority criteria were consolidated until the hierarchical arrangement of criteria at the lowest level was achieved (Rahmatdin and Abdul, 2016; Saaty, 1994).

## 3. Results and Discussion.

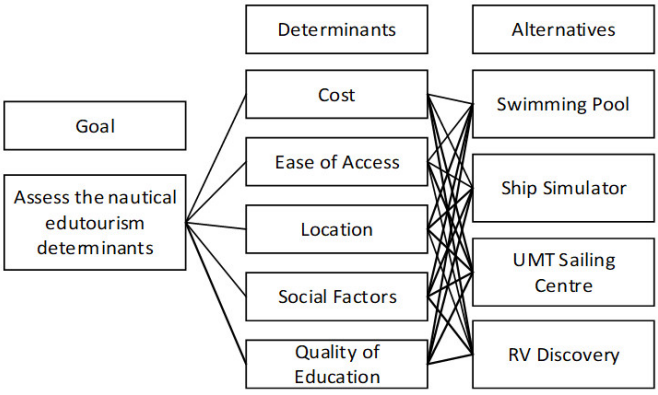
This study included a total of 8 participants. The participants were involved three groups: Public, Government Workers, and Teachers. The Public group consisted of 2 participants (25%), the Government Worker group consisted of 3 participants (37.5%), and the Teacher group consisted of 3 participants (37.5%). Among the participants, 5 individuals (62.5%) were male, while 3 individuals (37.5%) were female. Out of the total participants, 6 individuals (75%) were between the ages of 26 and 35. One participant (12.5%) fell into the age group of 36-45, while another participant (12.5%) belonged to the age group of 46-55. Participants who did not take part in the study were above the age of 55.

In this study, the procedure of the AHP can be elucidated through the subsequent steps:

Step 1: Identify and decompose the problem.

This is the pivotal and crucial aspect of decision-making. The process relies on the fundamental step of organizing the decision problem into a hierarchical structure. Hierarchy denotes the correlation between elements at a certain level and those at the level directly beneath it. It is crucial to recognize that when comparing elements at each level, a decision-maker only needs to compare the contribution of the lower-level elements to the upper-level one.

Figure 2: Hierarchy model of the criteria to assess the priority selection of nautical edutourism criteria and alternatives.




Source: Authors.

Step 2: Construct a series of matrices for comparing pairs of elements.

Data is gathered from experts or decision-makers who assess the alternatives in a hierarchical structure using a qualitative scale through pair-wise comparison. Each criterion is compared and translated into numerical values (Rahmatdin and Abdul, 2016).

Each element in a higher tier is utilized to compare the elements in the tier directly below, it is reasonable to use pair-wise matrix calculation when criterion A is more important than criterion B and is rated at x1. In this case, criterion B is considered less important than A and is valued at 1/x1, as indicated in Table 3. For instance, the cost had a higher significance of 1.1472 compared to the ease of access, whereas the ease of access had a lower significance of 0.8717 compared to the cost.

Step 3: Determine the weight values of the criteria.

The priority vector for the main criteria was determined by summing the values in each column of the reciprocal matrix for the cost, ease of access, location, social factors, and quality of education, as shown in Table 3. Subsequently, the matrix's elements were divided by the sum of their respective columns to obtain normalised relative weights. The total of each column equaled 1. For instance, the factor that determine the state of

the ease of access:

$$\frac{Weight\,of\,main\,criteria}{Sum\,of\,ease\,of\,access} = normalized\,relative\,weight\,of\,criteria$$

Then, the normalized relative weight of the main criteria was calculated as follows:

$$\frac{0.8717}{7.5226} = 0.1159$$

Other normalized relative weights of criteria were computed in Table 4.

The weight values of all the main criteria are determined using Equation 2. Given the criterion 'Cost' for example, the weight value is computed as follows:

$$W_k = \frac{0.1329 + 0.2427 + 0.0689 + 0.2395 + 0.1040}{5} = 0.1576$$

The same calculation formula is utilised to evaluate the remaining criterion. The Normalised Principal Eigenvector or weight value of the criteria was obtained by calculating the average across the rows in Table 5.

Legends: NOC = Number of Criterion, Wk = Weight value, NPE = Normalized principal Eigenvector.

Step 4: Evaluate the coherence of all comparison matrices.

As referred to Equation 3, the average of Normalized Principle Eigenvector was calculated to obtain the maximum eigenvalues, λmax as in Table 6. Then, sum all the consistency measures of each criterion;

Each row from Table 6. The λmax is obtained from as follows:

$$\frac{(5.3208 + 5.3199 + 5.4519 + 5.2459 + 5.4479)}{5} = 5.3573$$

The Consistency index, CI was obtained by applying Equation 4 as below:

$$\frac{\lambda_{max} - n}{n - 1} = \frac{5.3573 - 5}{5 - 1} = 0.0893$$

The appropriate value for the Random Consistency Ratio (RI) can be found in Table 1. In this case, the RI is equal to 1.12, and the matrix size is five for the pairwise criterion. The calculation of the Consistency Ratio (CR), as defined in Equation 5, is presented below:

$$\frac{CI}{RI} = CR\ then\ applies\ to\ calculate$$

$$\frac{0.0893}{1.12} = 0.0798\ equal\ to\ 7.98\%$$

$$less\ than\ 10\%,\ which\ is\ consistent$$

Consistency Ratio = 0.0798 or 7.98%, CI = 0.0893, Principle Eigenvalue, λmax = 5.3573

Step 5: Consolidate the ultimate priorities of the criteria.

The value of the Normalised Principle Eigenvector was used to rank each of the main criteria. The Normalised Principle Eigenvector can be converted to a percentage by multiplying it by 100%. The weight of the Normalised Principle Eigenvector indicates the ranking of the criteria, with a higher value indicating a higher priority or rank. The results presented in Table 2 show the prioritisation of criteria for selecting nautical Edutourism. The criteria are arranged in a specific order, with the highest rank given to the quality of education (0.3701), followed by ease of access (0.2326). The cost is ranked third (0.1576), while social factors are ranked fourth (0.1224). Lastly, the location is ranked fifth (0.1173). The Consistency Ratio, with a value of 0.0798, validates the survey results as both consistent and reliable.

Table 2: Percentage values of normalized principal eigenvector.

| Main Criteria | Normalized Principle Eigenvector | Normalized Principle Eigenvector in Percentage | Rank |
|---|---|---|---|
| Cost | 0.1576 | 15.76% | 3 |
| Ease of Access | 0.2326 | 23.26% | 2 |
| Location | 0.1173 | 11.73% | 5 |
| Social Factors | 0.1224 | 12.24% | 4 |
| Quality of Education | 0.3701 | 37.01% | 1 |

Source: Authors.

Subsequently, all of the alternatives were determined through analogous procedures and tabulated in Table 8, 9, 10, 11, and 12. Next, the new weights or normalized weighting vectors for all the alternatives are calculated based on the obtained weighting vector values of both the main criteria and alternatives. The purpose of this calculation is to derive the normalized weighting vector values of the evaluation criteria. This is done by multiplying the weighting vector value of each alternative in the specific group with the weighting vector value of the main criteria of the group. The normalized weighting vector w(Swp, Shs, Sc, RVdis) values for all the alternatives in this group, specifically in terms of group cost, were obtained as follows:

COST Total Wk/NOC

Swp: 0.932980332

Shs: 1.540766277

Sc: 0.58517877

RVdis: 0.94107462

Legends: M-C = Main-criteria, Alternatives = ALT, Normalized Principle Eigenvector = NPE, Overall Normalized Principle Eigenvector = ONPE Alternative Rank = ALTR, Overall

Rank = OR, CI= Consistency Index, CR= Consistency Ratio, Swp= UMT Swimming Pool, Shs= Ship Simulator, Sc= UMT Sailing Centre, RVdis= RV Discovery.

The overall ranking of all the 4 alternatives can be summarised in Table 7.

Table 3: Sum of the pairwise comparison and weight of criteria.

| Criteria | Cost | Ease of Access | Location | Social Factors | Quality of Education |
|---|---|---|---|---|---|
| Cost | 1 | $X_1$= 1.1472 | 0.6623 | 1.9138 | 0.2429 |
| Ease of Access | $\frac{1}{x_1}$ =0.8717 | 1 | 3.1654 | 2.4199 | 0.4749 |
| Location | 1.5098 | 0.3159 | 1 | 0.8963 | 0.2394 |
| Social Factors | 0.5225 | 0.4132 | 1.1156 | 1 | 0.4994 |
| Quality of Education | 3.6186 | 1.8499 | 3.6702 | 1.7595 | 1 |
| Sum | 7.5226 | 4.7263 | 9.6136 | 7.9896 | 2.4566 |

Source: Authors.

Table 4: Normalized relative weight.

| Criteria | Cost | Ease of Access | Location | Social Factors | Quality of Education |
|---|---|---|---|---|---|
| Cost | 0.1329 | 0.2427 | 0.0689 | 0.2395 | 0.1040 |
| Ease of Access | 0.1159 | 0.2115 | 0.3292 | 0.3028 | 0.2033 |
| Location | 0.2007 | 0.0668 | 0.1040 | 0.1121 | 0.1025 |
| Social Factors | 0.0694 | 0.0874 | 0.1160 | 0.1251 | 0.2138 |
| Quality of Education | 0.4810 | 0.3914 | 0.3817 | 0.2202 | 0.3762 |

Source: Authors.

Table 5: The weight value of evaluation criteria.

| Criteria | Cost | Ease of Access | Location | Social Factors | Quality of Education | Total $W_k$/ NOC | NPE |
|---|---|---|---|---|---|---|---|
| Cost | 0.1329 | 0.2427 | 0.0688 | 0.2395 | 0.1039 | 0.7880/5 | 0.1576 |
| Ease of Access | 0.1158 | 0.2115 | 0.3292 | 0.3028 | 0.2033 | 1.1629/5 | 0.2325 |
| Location | 0.2007 | 0.0668 | 0.1040 | 0.1121 | 0.1025 | 0.5862/5 | 0.1172 |
| Social Factors | 0.0694 | 0.0874 | 0.1160 | 0.1251 | 0.2138 | 0.6119/5 | 0.1223 |
| Quality of Education | 0.4810 | 0.3914 | 0.3817 | 0.2202 | 0.3762 | 1.8507/5 | 0.3701 |
| | | | | | | SUM | 1 |

Source: Authors.

Table 6: Calculation of maximum eigenvalues.

| | Cost | Ease of Access | Location | Social Factors | Quality of Education | Consistency Measure |
|---|---|---|---|---|---|---|
| Cost | 0.1576 | 0.2668 | 0.0776 | 0.2342 | 0.1022 | 5.3207 |
| Ease of Access | 0.1373 | 0.2325 | 0.3711 | 0.2961 | 0.2001 | 5.3198 |
| Location | 0.2379 | 0.0734 | 0.1172 | 0.1097 | 0.1008 | 5.4519 |
| Social Factors | 0.0823 | 0.0961 | 0.1308 | 0.1223 | 0.2103 | 5.2458 |
| Quality of Education | 0.5703 | 0.4303 | 0.4303 | 0.2153 | 0.3701 | 5.4478 |
| | | | | | Sum | 26.7863 |

Source: Authors.

Table 7: Overall ranking of alternatives for Nautical Edutourism.

| Criteria | ONPE | OR |
|---|---|---|
| $S_{wp}$ | 0.264737 | 2 |
| $S_{hs}$ | 0.373635 | 1 |
| $S_c$ | 0.164177 | 4 |
| $RV_{dis}$ | 0.19745 | 3 |

Source: Authors.

Table 8: Pairwise comparison and weight value of evaluation of alternative of criteria cost.

| **COST** | **$S_{wp}$** | **$S_{hs}$** | **$S_c$** | **$RV_{dis}$** | **Total $W_k/NOC$** | **NPE** |
|---|---|---|---|---|---|---|
| **$S_{wp}$** | 1 | 0.5747 | 1.6093 | 1.0366 | 0.9329 | 0.2332 |
| **$S_{hs}$** | 1.7399 | 1 | 2.7635 | 1.4809 | 1.5407 | 0.3851 |
| **$S_c$** | 0.6213 | 0.3618 | 1 | 0.6593 | 0.5851 | 0.1462 |
| **$RV_{dis}$** | 0.9646 | 0.6752 | 1.5166 | 1 | 0.9410 | 0.2352 |
| **SUM** | 4.3259 | 2.6118 | 6.8895 | 4.1769 | 3.9997 | 1 |
| CI= 0.001721, CR= 0.001912, Principle Eigen Value, λmax= 4.005162 | | | | | | |

Source: Authors.

Table 9: Pairwise comparison and weight value of evaluation of alternative of criteria ease of access.

| **EASE OF ACCESS** | **$S_{wp}$** | **$S_{hs}$** | **$S_c$** | **$RV_{dis}$** | **Total $W_k/NOC$** | **NPE** |
|---|---|---|---|---|---|---|
| **$S_{wp}$** | 1 | 0.8029 | 1.0194 | 1.1402 | 0.9627 | 0.2406 |
| **$S_{hs}$** | 1.2453 | 1 | 1.6093 | 1.7320 | 1.3364 | 0.3341 |
| **$S_c$** | 0.9809 | 0.6213 | 1 | 1.3594 | 0.9350 | 0.2337 |
| **$RV_{dis}$** | 0.8770 | 0.5773 | 0.7355 | 1 | 0.7657 | 0.1914 |
| **SUM** | 4.1032 | 3.0016 | 4.3643 | 5.2317 | 3.9998 | 1 |
| CI= 0.003928, CR= 0.004365, Principle Eigen Value, λmax= 4.011784 | | | | | | |

Source: Authors.

Table 10: Pairwise comparison and weight value of evaluation of alternative of criteria location.

| **LOCATION** | **$S_{wp}$** | **$S_{hs}$** | **$S_c$** | **$RV_{dis}$** | **Total $W_k/NOC$** | **NPE** |
|---|---|---|---|---|---|---|
| **$S_{wp}$** | 1 | 0.7153 | 2.8647 | 1.1282 | 1.1170 | 0.2792 |
| **$S_{hs}$** | 1.3979 | 1 | 3.7150 | 1.3844 | 1.4833 | 0.3708 |
| **$S_c$** | 0.3490 | 0.2691 | 1 | 0.4575 | 0.4131 | 0.1032 |
| **$RV_{dis}$** | 0.8863 | 0.7222 | 2.1856 | 1 | 0.9864 | 0.2466 |
| **SUM** | 3.6333 | 2.7068 | 9.7654 | 3.9702 | 3.9998 | 1 |
| CI=0.001818, CR= 0.00202, Principle Eigen Value, λmax= 4.005454 | | | | | | |

Source: Authors.

Table 11: Pairwise comparison and weight value of evaluation of alternative of criteria social factors.

| **SOCIAL FACTORS** | **$S_{wp}$** | **$S_{hs}$** | **$S_c$** | **$RV_{dis}$** | **Total $W_k/NOC$** | **NPE** |
|---|---|---|---|---|---|---|
| **$S_{wp}$** | 1 | 1.6464 | 3.1130 | 1.1995 | 1.4753 | 0.3688 |
| **$S_{hs}$** | 0.6073 | 1 | 2.0764 | 0.9128 | 0.9687 | 0.2421 |
| **$S_c$** | 0.3212 | 0.4815 | 1 | 0.7085 | 0.5473 | 0.1368 |
| **$RV_{dis}$** | 0.8336 | 1.0954 | 1.4114 | 1 | 1.0085 | 0.2521 |
| **SUM** | **2.7622** | **4.2235** | **7.6009** | **3.8208** | | **1** |
| CI= 0.013836, CR= 0.015373, Principle Eigen Value, λmax= 4.041508 | | | | | | |

Source: Authors.

## 4. Results and Discussion.

Table 2 indicates that the main criteria, quality of education (0.37014), ranked first. Among the four alternatives, the ship simulator (0.3921) achieved the highest rank. Thus, the ship simulator at UMT offers students a superior level of education,

Table 12: Pairwise comparison and weight value of evaluation of alternative of criteria quality of education.

| QUALITY OF EDUCATION | $S_{wp}$ | $S_{hs}$ | $S_c$ | $RV_{dis}$ | Total $W_p/NOC$ | NPE |
|---|---|---|---|---|---|---|
| $S_{wp}$ | 1 | 0.7329 | 1.8239 | 1.3844 | 1.0875 | 0.2718 |
| $S_{hs}$ | 1.3642 | 1 | 2.8057 | 2.0903 | 1.5683 | 0.3920 |
| $S_c$ | 0.5482 | 0.3564 | 1 | 1.1304 | 0.6448 | 0.1612 |
| $RV_{dis}$ | 0.7222 | 0.4783 | 0.8846 | 1 | 0.6992 | 0.1748 |
| **SUM** | **3.6348** | **2.5678** | **6.5142** | **5.6052** | | **1** |
| CI= 0.007481, CR= 0.008313, Principle Eigen Value, λmax= 4.022444 | | | | | | |

Source: Authors.

as it is the sole university in Malaysia equipped with a ship handling simulator. This type of education is scarce and exclusive.

With a score of 0.2326, the criterion of ease of access ranks second. Typically, the majority of Malaysian schools lack access to advanced educational resources like ship simulators and sailing sports instruction. This criterion also ranks the ship simulator (0.3341) first among all four alternatives.

The third criterion that has been ranked is cost, with a score of 0.1576. The cost is typically the primary consideration when selecting an Edutourism destination. Students prioritise the cost factor above all others when deciding on a destination for their educational trip. Among the various alternatives, the ship simulator (0.3852) is the top-ranked option in terms of affordability for this type of visit, as indicated by the respondents.

Social factors carry a weight of 0.1224, positioning them in the fourth rank. Among the other alternatives, the UMT swimming pool (0.3688) is ranked first for this criterion. The location (0.1173) is the fifth-ranking criterion, with the ship simulator (0.3708) being the top-ranked alternative within this criterion. The ship simulator has the highest potential for becoming a facility for nautical edutourism, with a ranking of 0.3736. The swimming pool comes in second place with a ranking of 0.2647, followed by the RV Discovery in third place with a ranking of 0.1975, and the UMT Sailing Centre in fourth place with a ranking of 0.1642.

## Conclusions.

The concept of self-funding universities can be realised with various means, not limited solely to Nautical Edutourism. The advancement of technology and the use of online platforms have the potential to enhance the concept of Edutourism by facilitating promotion and attracting visitors. If this concept can be actualized, it will yield numerous advantages for the higher education institution, in addition to periodic financial gains.

According to the obtained result, Nautical Edutourism has the potential to generate income for universities. The majority of the respondents concurred that the development of Edutourism in Nautical Studies is feasible due to the distinctive nature of the concept, which is exclusive to Universiti Malaysia Terengganu. The concept itself is innovative in its own manner, while the implementation will be cost-effective as it solely relies on pre-existing infrastructure.

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