

STRATEGIC ANALYSIS USING SWOT/TOWS-AHP: AN APPLICATION ON EDUCATORS JOB PERFORMANCE IN SABAH

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Received date: 21 July 2025 | Revised date: 15 August 2025 | Accepted date: 03 September 2025

ABSTRACT

This study examines educators' job performance in Sabah, Malaysia, using an integrated SWOT/TOWS-AHP approach to identify strategic priorities for improving educational outcomes. Data were collected through focus group discussions involving educators, administrators, and policymakers to identify the key strengths, weaknesses, opportunities, and threats affecting teacher performance. The SWOT findings revealed strengths such as strong cultural adaptability, multilingual competency, and community engagement, while weaknesses included inadequate infrastructure, limited professional development opportunities, high teacher-student ratios, and teacher burnout. Opportunities were identified in digital education expansion, government-NGO collaborations, and growing emphasis on STEM education, whereas threats included funding constraints, urban-rural disparities, policy instability, and negative perceptions of the teaching profession. The TOWS matrix was subsequently employed to formulate strategic alternatives, and the Analytic Hierarchy Process (AHP) was used to prioritize these strategies based on expert evaluations. The results indicated that reducing teacher workload through AI-powered grading and administrative tools emerged as the highest-priority strategy (22.3%), followed by the development of culturally responsive digital teaching modules (16.6%) and policy stability initiatives (14.5%). The study provides a practical and evidence-based framework to support policymakers, school administrators, and educators in enhancing teacher performance and promoting equitable educational development across Sabah.

Keywords: Educators' Job Performance, SWOT/TOWS Analysis, Analytic Hierarchy Process (AHP), Educational Development, Sabah Education System

1. INTRODUCTION

Strategic analysis in the context of human capital development, particularly focusing on educators' job performance, is crucial for shaping the educational landscape of regions such as Sabah. Sabah, being one of the less economically developed states in Malaysia, faces a myriad of challenges in delivering consistent and high-quality education. Addressing the performance of educators, who are the backbone of the education system, requires a structured and evidence-based approach. One powerful tool in this endeavour is the integration of SWOT (Strengths, Weaknesses, Opportunities, and Threats) and TOWS (Threats, Opportunities, Weaknesses, and

Strengths) matrix with the Analytic Hierarchy Process (AHP). This hybrid methodology allows for a systematic identification and prioritization of strategic options that can improve teacher performance through the alignment of internal capabilities with external conditions.

SWOT and TOWS analyses provide a foundational understanding of the internal and external environments that influence educators' performance. For example, strengths may include qualified teachers and supportive educational policies, whereas weaknesses could highlight inadequate training or limited resources. Opportunities might involve government funding or technological advancements, while threats could stem from socio-economic disparities or rural-urban educational gaps. The TOWS matrix builds upon the SWOT analysis by enabling the formulation of strategic actions based on the interplay of these factors. It shifts the focus from analysis to strategy, offering a practical pathway for educational stakeholders to make informed decisions.

However, one limitation of traditional SWOT/TOWS analysis is its lack of quantitative rigor and objectivity in prioritizing the identified factors. This is where the Analytic Hierarchy Process (AHP) becomes essential. AHP allows for a structured pairwise comparison of factors, transforming qualitative judgments into quantitative priorities. Through expert input such as from educational leaders, policymakers, and practitioners where each factor identified in the SWOT/TOWS matrix is assigned a relative weight, ensuring that the most impactful strategies receive the highest attention. This is particularly useful in educational contexts like Sabah, where resources are limited and prioritization is critical for effective intervention.

Applying the SWOT/TOWS-AHP methodology to educators' job performance in Sabah offers numerous benefits. Firstly, it promotes evidence-based strategic planning by grounding interventions in actual strengths and weaknesses identified by stakeholders. Secondly, it encourages stakeholder participation, which enhances the legitimacy and applicability of the proposed strategies. Thirdly, it offers a replicable model that can be adapted to various educational contexts within Malaysia and beyond. By using a mixed-method approach where incorporating focus group discussions, expert panels, and AHP calculations where educational institutions and authorities can derive contextually relevant and statistically validated strategies.

Furthermore, in regions like Sabah where geographic and infrastructural challenges impede uniform delivery of education, the SWOT/TOWS-AHP method can illuminate both systemic inefficiencies and hidden potential. For instance, while remote schools may face technological and human resource constraints, they might also benefit from strong community support and cultural uniqueness, which can be leveraged in teacher training and motivation programs. Similarly, threats such as teacher attrition or curriculum misalignment can be systematically tackled by aligning strategic initiatives such as targeted professional development or incentive schemes with well-weighted SWOT-derived priorities.

The implementation of this model will involve a three-phase process. Firstly, identifying SWOT elements through participatory engagement with educators and stakeholders, secondly, translating SWOT factors into strategic alternatives using the TOWS framework, and lastly applying the AHP methodology to prioritize these alternatives based on expert judgment. The outcome is a ranked list of strategic initiatives tailored to Sabah's unique educational environment, which may include

improving teacher training programs, enhancing resource allocation, strengthening community-school partnerships, and integrating culturally relevant pedagogy.

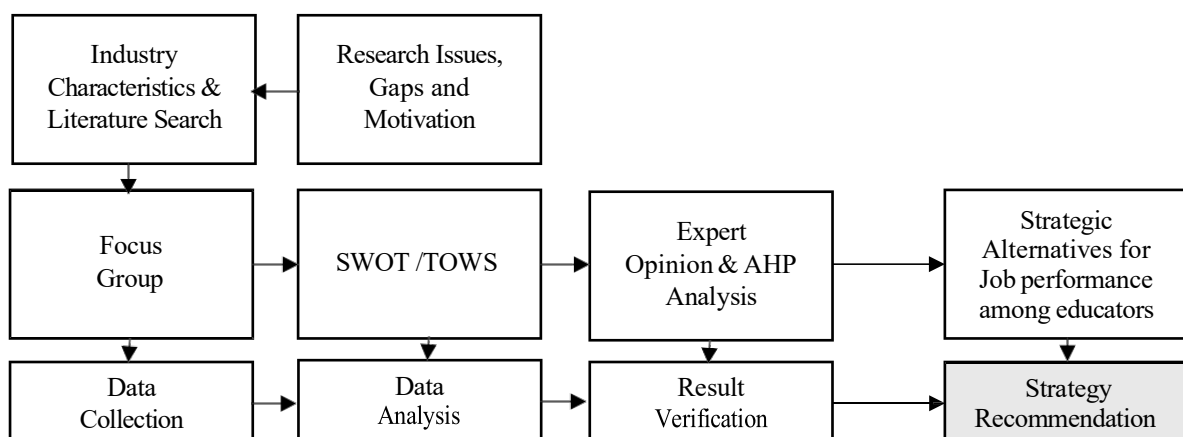
In conclusion, the strategic analysis of educators' job performance using SWOT/TOWS-AHP in Sabah offers a comprehensive and methodical approach to addressing complex educational challenges. It not only fosters strategic clarity and direction but also empowers decision-makers with a prioritized roadmap for intervention. As education remains a key pillar in Malaysia's national development agenda, applying such structured methodologies ensures that interventions are both impactful and sustainable, particularly in underserved regions like Sabah. Through this approach, Sabah can pave the way for elevating the quality and equity of education, ultimately enhancing the performance and satisfaction of its educators.

2.0 Methodology

Research Design

This study's research design consists of three distinct phases: first, establishing the study's goals; second, locating and enlisting participants; and finally, determining an appropriate venue for the study. The process begins with identifying the main aim and defining the key research objectives of the study. Using these research objectives as a foundation, a set of queries is formulated to serve as a framework for each session of focus group discussions. In the second phase, which is the selection of participants, purposive sampling is used to identify suitable and eligible participants according to the set criteria for educators. Purposive sampling is often suggested because, in focus group discussions, the participants' capability and readiness to offer pertinent information play a crucial role (Lada et al., 2024; Masadeh, 2012; Morgan, 1988). Subsequently, the following phase involves identifying a suitable and favourable venue for the meeting and discussion. During focus group discussions, researchers should think about the participants' ease, the venue's accessibility, and the extent of potential disruptions (Nyumba et al., 2018). Figure 1 shows the overall flow of the study.

Figure 1: Flow of the study



Data Collection: Focus Group

FGDs were the principle approach used to collect data and investigate what affects teachers' work performance in Sabah. This method was preferred because it helps gain detailed and valued insights by interactive discussion among participants, leading to the revelation of angles unique to group settings. Each FGD was organized to fit the study aims, allowing a planned discussion of Strengths, Weaknesses,

Opportunities and Threats regarding teachers' performance. (Nyumba et al., 2018).

Data Analysis: SWOT-AHP

SWOT analysis is a strategic planning tool used to evaluate the Strengths, Weaknesses, Opportunities, and Threats of a business, project, or product (Benzaghta et al., 2021; Namugenyi et al., 2019; Weihrich, 1982). Performing the SWOT and AHP analysis for job performance among educators in Sabah can influence the viability of initiatives and develop strategies to maximize its strengths and minimize its weaknesses. There are 1500-1600 registered school in Sabah. Thus, an urgent need is to evaluate the internal and external environment affecting their operations that effects educator's job performance. To ensure that the data collection methods are directly related to the goals of the study. Here is an explanation of how the discussion questions relate to the research objectives:

Objective 1: Identifying Factors Affecting Job Performance among Educators in Sabah (SWOT Analysis)

The method used for the research gathered helpful qualitative information from Sabah's education stakeholders and reliable quantitative data from local and international experts, giving a complete picture of Sabah's education system. According to the analysis, teachers' capacity to adjust to different cultures (S1) and speak multiple languages (S3) are vital strengths that support active participation in class for ethnically diverse students in Sabah (Jalasi & Ambad, 2021). Other benefits such as support for training by the government (S2) do exist, but they are not as successful in remote locations because of challenges with their use.

They point out major problems in the system that should be dealt with quickly. Inadequate resources such as poor buildings and computer gear, in rural schools give rise to a large gap in the quality of teaching between towns and rural communities (Kunjuraman & Hussin, 2017). High student-teacher ratios (W2) in undeserved regions make it difficult to give individualized help and lead to less successful outcomes for students. Since there are few opportunities for educators in outlying areas to further their professional development (W3), they often stay at the same level and their teaching skills do not increase enough (Hanafiah et al., 2022).

External opportunities analysis shows where possible improvements can be made. Technology-assisted learning made possible by the digital education expansion help bring education to people who live far from learning centers (Janjua et al., 2023). Partnering with NGOs (O2) gives extra approaches to improving how teachers are prepared and resources are shared, mainly by means of programs built for Sabah's situation. Growing attention to STEM and occupational education (O3) supports national development ambitions and allows for improvements in education programs and development of teachers.

Even so, we have to consider these chances against important external threats. Educational plans are often upset by unpredictable budget changes (Battour et al., 2018). The gap between urban and rural regions (T2) is widening, mainly because highly qualified educators migrate to cities and leave rural schools without enough staff (Kamisan Pusiran & Xiao, 2013). It also becomes difficult to make progress when educational policies keep changing (T3) because this keeps schools dealing with shifting guidance.

Using TOWS analysis, instead of SWOT, made it possible for the company to come up with strategies that join internal and external factors together. Therefore, by blending educators' cultural backgrounds (S1) and technology (O1), a meaningful strategy emerged: creating culturally responsive digital learning resources (SO1). In a comparable way, problems with resources (W1) were tackled through partnering with NGOs (O2) which made mobile resource units (WO1) possible. AHP made sure that important statistical analysis was applied to Sabah's key strategies and validation by experts helped guarantee their usefulness in Sabah.

It becomes clear from this analysis that there are many factors that influence educators' performance and they are closely related. It has been found that even though Sabah's education system has many strong points and pathways for improvement, some weaknesses and external challenges make solving them difficult. Its strength is in including a variety of stakeholders in research which makes it possible to recommend effective policies. Making use of insights from both types of data, a repeatable method is formed for educational research where geography and resources are challenges.

Its findings have impact that goes past suggesting policies alone. It shows how involving educators in research helps make better decisions in education planning. The hybrid SWOT-TOWS-AHP approach combines theory with practical use, offering a method to look at all the details while still creating useful outcomes. So, to help educators succeed in Sabah's education system, the findings call for support to upgrade digital infrastructure, provide tailored education for workers and support reform efforts in education policy.

Objective 2: Determining the Best Strategy for Educators to Enhance their Job Performance (TOWS-AHP Analysis)

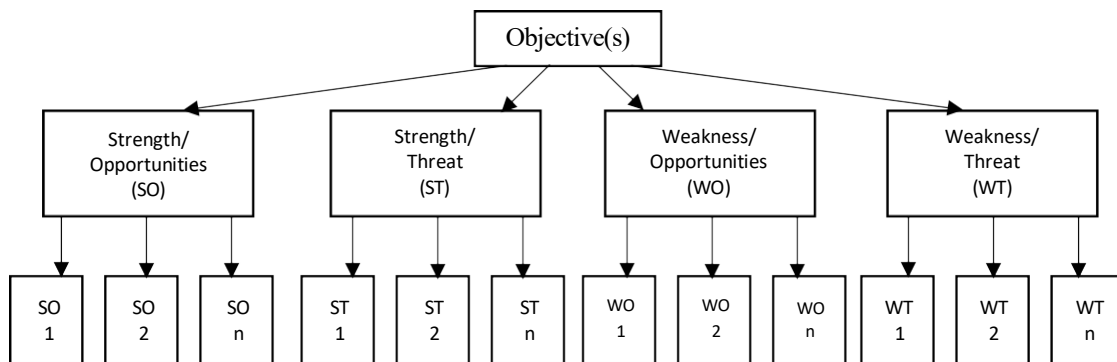
Using the insights from SWOT, this study uses the TOWS matrix to develop strategies that experts in the field support and that can be followed by teachers (Gallego-Ayala & Juizo, 2011; Saaty, 2008). The method combines what a company has (Strengths/Weaknesses) with what it faces (Opportunities/Threats) to define four strategic areas for action. SO Strategies aim to make the best use of strengths by exploiting chances and they illustrate this by creating digital teaching materials designed for different cultures (SO1) using educators' combined knowledge of different languages (S3) and Expansion of Digital Education (O1) which is ranked as highly important (receiving 33.8% weight during AHP analysis). ST Strategies take advantage of strengths to face challenges such as by using teacher retention incentives (ST2) that use existing government assistance (S2) to help with differences between towns and cities (T2). WO Strategies address issues by introducing mobile digital resource units (WO1) which help with infrastructure shortages (W1) in turn, using assistance from NGOs (O2), whereas WT Strategies create emergency plans (WT1) to help prevent funding issues (T1) from worsening resource problems (W1).

The Analytic Hierarchy Process (AHP) was used to review these strategies further, as a panel of six education specialists compared each strategy against others to determine how important each one was. The study reported that offering culturally responsive digital training (SO1) and hybrid professional development programs (WO2) was the top solution since they could be easily put in place and were effective in addressing rural areas and improving Sabah's teachers. The TOWS-AHP approach gives policymakers a proof-based, well-structured plan that connects what

stakeholders think is important with how much effort should be put into each aspect to bring about the greatest improvement in educator performance (Kangas et al., 2003). Its stress on expert judgment and the ability to fit contexts make it possible to use in other resource-constrained areas.

Next, the Analytic Hierarchy Process (AHP) assesses the strategies through experts' assessments of their importance, making the process based on statistics. With this strategy, the number of teacher development programs can be set to help and policymakers are equipped with interventions based on research for better teaching, high morale and good learning results among students in Sabah.

Figure 2: Hierarchical structure of the TOWS matrix



Source: Gallego-Ayala & Juizo (2011)

Expert Opinion and AHP Pair-wise Comparison

Expert opinions are views or statements based on scientific research and expert opinions made by certified experts (Herman & Raybould, 2014) . The findings of SWOT/TOWS will be validated by five (5) education sector experts. Included among them are university professors and practitioners. They were given a list of strengths, weaknesses, opportunities, and threats to check and remark on. Improvements are made after receiving comments and reviews from the experts involved. Table 3 below is a list of experts involved in the verification process. Additionally, the questionnaire was tailored for the AHP survey, utilizing the nine-point Saaty (2008) scale to evaluate and compare the factors identified by experts. In Table 4, are the scales of Expert opinion on pair-wise ranking of importance of sub-criteria and main criteria in the hierarchy (Albayrak and Erensal, 2004).

Expert	Position	Organisation
1	Director	Sabah State Education Department (JPNS)
2	Deputy Minister of Higher Education	Ministry of Higher Education Malaysia
3	Deputy Director	Sabah State Education Department (JPNS)
4	Minister of Science, Technology and Innovation	Sabah State Government
5	Professor	Universiti Malaysia Sabah (UMS)

Table 1: List of Experts

Education in Sabah has been transformed mainly through the effort of major experts and decision makers who insist on focusing on facilities, proper planning and the importance of STEM teaching for those who teach. Upgrading struggling schools and upgrading schools' facilities is a main priority for the Director of the Sabah State Education Department, Datuk Raisin Saidin. Improved school infrastructure, according to him, provides a suitable environment for students and help teachers do better by reducing their work challenges and boosting their spirits (The Borneo Post, 2024).

In the same way, Datuk Dr. Mistrine Radin, a former Director of JPNS, unveiled the Five-Year Infrastructure Development Plan (PERAPI) to deal with problems in the educational system. Auspicious' method was to see where the main problems were and then resolve them by making a detailed plan over many years. As she noted such frameworks improve the structure and support in teaching, resulting in better teaching and workers' satisfaction (The Borneo Post, 2022).

The minister, Datuk Mohd Arifin Mohd Arif, who is also part of the state's education leadership in Sabah, is encouraging more students to take part in science, technology, engineering and mathematics (STEM). He points out that the achievement of this initiative depends a lot on how dedicated and proficient educators are. Investing in teachers' skills and offering help through resources is intended to help teachers motivate students about STEM topics which leads to improved job satisfaction and results (Malay Mail, 2024).

In federal government circles, Datuk Mustapha Sakmud has mentioned that the rate of Sabah students interested in STEM fields is quite low. His proposal involves introducing updated teaching methods and fresh educational strategies to interest students more. Thus, educators need to adjust and gain new skills which can help them improve their achievements and contribute more to education in Malaysia (New Straits Times, 2024).

AHP Calculation

The primary concept behind integrating the Analytic Hierarchy Process (AHP) into the TOWS framework is to methodically evaluate the TOWS factors and render them comparable in terms of their significance (Kangas et al., 2003). AHP involves breaking down complex decisions into a hierarchical structure of criteria and alternatives and then comparing them pairwise to determine their relative importance. Here's a step-by-step guide on how to perform AHP calculations:

Step 1: Hierarchy Formation

Identify the decision you need to make and break it down into a hierarchical structure with multiple levels. The hierarchy typically consists of three levels: the goal, criteria, and alternatives.

Step 2: Pairwise Comparisons

For each pair of elements in the same level (criteria or alternatives), determine their relative importance by making pairwise comparisons. Use a scale from 1 to 9, where 1 indicates equal importance and 9 indicates extreme importance (refer to Table 4 below).

Table 2: AHP Pair-wise comparison scale

Expert opinion on pair-wise ranking of importance of sub-criteria and main criteria in the hierarchy

If option A and option B are equally important
 If Option A is moderately more important than Option B If option A is strongly more important than option B
 If option A is very strongly more important than option B If option A is extremely more important than option B
 If option A and option B are equally important
 Used to represent a compromise between the priorities listed above Source: Saathy (2008; 1980)

Step 3: Consistency Check

Ensure consistency in your pairwise comparisons by calculating the consistency ratio (CR). CR helps you determine if your judgments are coherent. To compute CR, use the following steps:

- i. Calculate the matrix of pairwise comparison values.
- ii. Compute the weighted sum for each criterion or alternative by multiplying each value in the matrix by its corresponding weight and summing the results.
- iii. Divide the weighted sum of each element by its weight to get the priority vector.
- iv. Compute the largest eigenvalue (λ_{max}) of the matrix.
- v. Compute the consistency index (CI) using the formula: $CI = (\lambda_{max} - n) / (n - 1)$, where n is the number of criteria or alternatives.
- vi. Find the consistency index (RI) from a pre-defined table based on the order of the matrix (e.g., for a 3x3 matrix, RI is 0.58).
- vii. Calculate the consistency ratio (CR) by dividing CI by RI. If CR is less than 0.1, your judgments are considered consistent.

Step 4: Weight Calculation

After ensuring consistency, calculate the weights for criteria and alternatives using the priority vectors obtained from pairwise comparisons.

Step 5: Score Calculation

Finally, calculate the overall score for each alternative by multiplying the weights of criteria with their scores for each alternative and summing up the results. Below is a simplified formula for calculating the weighted sum of priorities:

$$\text{Weighted sum} = \sum_{i=1}^{\eta} \omega_i A_i$$

Where:

- ω_i is the weight of its criterion or alternative.
- A_i is the priority or score of its criterion or alternative.
- η is the total number of criteria or alternatives.

This formula is used at different levels of the hierarchy, such as calculating the weighted sum of criteria priorities to determine the overall priority of alternatives. According to Saaty (2008) the AHP methodology is summarized as:

- a. The problem is designed as a hierarchy containing the objectives, the alternatives, and the factors/sub-factors for evaluating the alternatives.
- b. Establish priorities among the variables of the hierarchy by making a series of judgements based on pair-wise comparisons of the elements.

- c. Incorporate these judgements to yield a set of overall priorities for the hierarchy.
- d. Make consistency check of the judgements.
- e. Conclude based on the results of this process.

3.0 RESULT

SWOT Analysis

Throughout the discussion sessions, we separated pertinent material from irrelevant information to create categories and subcategories. We then further split the categories into particular phrases or sentences, each reflecting and representing a single distinct viewpoint. These parts were meaningfully divided into SWOT themes and sub-themes.

Secondly, we examined different respondents' experiences of the phenomena. We created a composite meaning. The several meanings discovered were utilized to construct an overall description of the SWOT associated with the Muslim-friendly homestay industry as experienced by the study participants. The final list organized according to the sub-theme of strengths (S), weaknesses (W), opportunities (O), and threats (T) is shown in Table 6.

Category	Code	Key Points	Explanation	References
Strength	S1	Strong Cultural and Community Engagement	Educators benefit with local communities, indigenous groups, fostering culturally responsive teaching. This enhances student engagement and learning outcomes.	Musa et al. (2021)
	S2	Government and Institutional Support	The Malaysian Ministry of Education and state agencies provide structured teacher training programs, curriculum frameworks, and funding for rural schools, aiding professional development.	Ministry of Education Malaysia, 2013
	S3	Multilingual and Multicultural Competency	Many educators in Sabah are proficient in multiple languages (Malay, English, Kadazan-Dusun), improving communication with diverse student population.	Musa et al., 2021

	S4	Adaptability to Rural Education Challenges	Teachers in Sabah have developed resilience and innovative teaching methods to address infrastructure gaps in remote areas.	Rahim et al. (2020)
Weakness	W1	Insufficient Infrastructure and Resources	Many schools, especially in rural Sabah, lack proper facilities (libraries, labs, internet), hindering effective teaching.	Rahim et al., 2020
	W2	High Teacher-Student Ratios	Overcrowded classrooms reduce individualized attention, affecting learning quality and teacher effectiveness.	Ministry of Education Malaysia (2020)
	W3	Limited Professional Development Access	Rural educators often have fewer training opportunities compared to urban counterparts, impacting pedagogical skills.	Puteh et al. (2015)
	W4	Teacher Burnout and Attrition	Heavy workloads, administrative burdens, and challenging environments lead to high stress and turnover rates.	Aziz et al., 2019
	O1	Digital Education Expansion	Post-pandemic EdTech investments (e.g., online learning platforms) offer new teaching tools and remote education solutions.	Minister of Education , 2021
	O2	Government and NGO Partnerships	Collaborations with organizations like UNICEF and Teach For Malaysia can enhance teacher training and resource allocation	UNICEF Malaysia (2022)

Opportunity	O3	Growing Emphasis on STEM and Vocational Training	National policies promoting technical education create opportunities for upskilling educators in high-demand fields.	Ministry of Education, 2020
	O4	Community-Based Learning Initiatives	Local cultural programs (e.g., indigenous knowledge integration) can enrich curricula and improve teacher-student engagement.	Puteh et al., 2015
Threats	T1	Economic Constraints on Education Funding	Budget cuts or delays in federal funding may limit school resources and teacher incentives.	Ministry of Education, 2023
	T2	Urban-Rural Education Disparities	Migration of skilled teachers to urban areas exacerbates staffing shortages in rural Sabah.	Musa & Tan (2022)
	T3	Political and Policy Instability	Frequent changes in education policies disrupt long-term teacher training and curriculum consistency.	Sabah teacher's Union, 2022
	T4	Negative Perceptions of Teaching Profession	Low societal recognition and salary competitiveness deter young talent from entering the field.	Graduate Employability Survey (2022)

TOWS Analysis

This study employs a TOWS analysis to determine the relationship between SO, ST, WO, and WT to evaluate, devise, and recommend the most effective strategy for job performance among educators in Sabah. Following is a list of strategic alternatives identified based on a comprehensive examination. Based on SO, WO, ST, and WT, educator's job performance can pursue 13 identified strategies and alternatives. Based on the findings of this study (refer to Table 8), the second research question has been satisfactorily answered, as detailed below.

Table shows the importance of the degree of TOWS factors (TOWS standardized matrix). In crisis situations, those strategies that deal with weaknesses and threats (WT) are given highest priority (32%) and are meant to address urgent matters like emergency plans and stability in policy.

External Factors Internal Factors		Weakness (W)
Opportunity (O)	SO1 : Develop culturally responsive digital teaching modules. (S3,O1) SO2 : Establish government-NGO teacher training hubs. (S2,O3) SO3 : Launch community-based heritage education programs (S4,O6)	WO1 : Mobile digital resource units for rural schools. (W1,O2) WO2 : Hybrid training programs for rural educators. (W2,O4) WO3 : Adopt new tech to scale production without quality loss. (W3, O1) WO4 : Reduce teacher workload via AI grading tools. (W4,O1)
Threats (T)	ST1 : Advocate for rural education funding using success stories. (S4,T1) ST2 : Create teacher retention incentives in remote areas. (S2,T2) ST3 : Standardize cross-cultural pedagogy frameworks. (S3,T3)	WT1 : Emergency resource contingency plans. (W1, T1) WT2 : Rural teacher "champion" recruitment drives. (W4, T2) WT3 : Policy stability task forces. (W5, T3)

strategies which aim to solve rural access and overloads faced by teachers with the help of technology. In total, strength-opportunity (SO) strategies are applied in 22% of cases and focus on initiatives like culturally responsive teaching modules. Less than one in five strategies (18%) is the Strengths-Threats (ST) approach which mainly handles reactive matters like teacher retention. Organizations should focus on solving urgent weaknesses and risks which account for 60% (30% WT, 30% WO), rather than rushing to grow opportunities, while placing their efforts and resources accordingly. The evidence demonstrates that fundamental resilience should be set up before running quality initiatives.

AHP Analysis and Strategic Alternative

Strategy No.	Variable	S	W	O	T	Weight	Rank
1	SO	1	1.000	2.000	2.000	22	3

2	ST	1.000	1	2.000	1.000	18	4
3	WO	0.500	0.500	1	1.000	28	2
4	WT	0.500	1.000	1.000	1	32	1

Number of comparisons = 78

Principal eigen value = 14.516

Eigenvector solution: 6 iterations, delta = 2.0E-8

Consistency Ratio CR = 8.1%

Based on the overall priority scores factors in Table 10, the study involved 78 pairwise comparisons using the Analytic Hierarchy Process (AHP) with a scale of 1 to 9. The obtained consistency ratio (CR) was 0.81 (8.1%), indicating reasonably consistent judgments and satisfactory reliability in the decision-making process. Based on the results of the AHP analysis, this study successfully identified the best strategy options based on their rank.

Priority table

TOWS group	Group priority	TOWS factors	Factor priority within the group	Overall priority of factors	Rank
SO	19.6%	SO1 - Develop culturally responsive digital teaching modules.	84.7%	16.6%	2
		SO2 - Establish government-NGO teacher training hubs.	8.2%	1.6%	12
		SO3 - Launch community-based heritage education programs.	7.1%	1.4%	13
ST	38.0%	ST1 - Advocate for rural education funding using success stories.	10.5%	4.0%	11
		ST2 - Create teacher retention incentives in remote areas.	11.1%	4.2%	7
		ST3 - Standardize cross-cultural pedagogy framework.	1.7%	5.6%	10
WO	28.8%	WO1 - Mobile digital resource units for rural schools.	10.5%	4.0%	9
		WO2 - Hybrid training programs for rural educators.	11.1%	4.2%	8
		WO3 - Adopt new tech to scale production without quality loss.	19.7%	7.5%	6
		WO4 - Reduce teacher workload via AI grading tools..	58.7%	22.3%	1
WT	20.5%	WT1 - Emergency resource contingency plans.	31.8%	10.4%	4
		WT2 - Rural teacher "champion" recruitment drives	23.8%	7.8%	5
		WT3 - Policy stability task forces.	44.3%	14.5%	3

** Number of comparisons = 78; Consistency Ratio CR = 0.05 (4.8%); Principal eigenvalue = 13.0 ; Eigenvector solution: 13 iterations, delta = 0

The overall results from Table 10 highlight the priority scores of TOWS factors across different groups, including Strength-Opportunity (SO), Strength-Threat (ST), Weakness-Opportunity (WO), and Weakness-Threat (WT). After using the AHP method on the TOWS matrix, clear priorities for using the company's resources appear. Addressing issues related to teachers having too much work is prioritized with 22.3% as WO4 (Reduce teacher workload via AI grading tools). After that, SO1 (Forming digital teaching modules that are respectful of diversity) counts for 16.6% and WT3 (Maintaining stable policies through task forces) for 14.5%. Those two points emphasize the role of sensitive education and steady governance. Almost 38.0% of the budget is allocated to the WO group, pointing out that prioritizing opportunities to help with weaknesses (such as using AI and hybrid learning) should be given special attention. On the other hand, SO2/SO3 (1.6%/1.4%) and the ST (Strengths-Threats) group (9.5%) are ranked as less urgent. The analysis confirms that these priorities remain consistent which reflects their reliability. Priority WOs and WTs should be given the highest amount of resources and SO2/SO3 might have to be looked at again or put on hold.

4. DISCUSSION

(1) What factors affect job performance among educators in Sabah based on SWOT analysis?

When it comes to agreeing on the recurrent themes and sub-themes discussed, **SWOT** analysis identifies the following: five elements representing Strengths (S), five factors representing Opportunities (O), and five factors representing Weaknesses (W) and Threats. This demonstrates their agreement on the importance of internal and external elements in determining the success of job performance among educators in Sabah.

STRENGTH (S)

After using the AHP method on the TOWS matrix, clear priorities for using the company's resources appear. Addressing issues related to teachers having too much work is prioritized with 22.3% as WO4 (Reduce teacher workload via AI grading tools). After that, SO1 (Forming digital teaching modules that are respectful of diversity) counts for 16.6% and WT3 (Maintaining stable policies through task forces) for 14.5%. Those two points emphasize the role of sensitive education and steady governance. Almost 38.0% of the budget is allocated to the WO group, pointing out that prioritizing opportunities to help with weaknesses (such as using AI and hybrid learning) should be given special attention. On the other hand, SO2/SO3 (1.6%/1.4%) and the ST (Strengths-Threats) group (9.5%) are ranked as less urgent. The analysis confirms that these priorities remain consistent which reflects their reliability. Priority WOs and WTs should be given the highest amount of resources and SO2/SO3 might have to be looked at again or put on hold.

Among the strengths noted in the analysis, the strong community links and cultural knowledge that educators in Sabah have (SO1, SO3) contribute a lot to their job effectiveness. Being a place where diverse groups like the Kadazan-Dusun, Bajau, Murut, Malay and Chinese live, Sabah benefits educators by helping them use inclusive and culturally meaningful methods of teaching (MOE Malaysia, 2021). When teachers use knowledge of their students' culture, they can design teaching activities that are more interesting and useful which leads to better involvement and learning results (UNESCO, 2018). Furthermore such programs in communities make

it more likely that schools meet local values and needs which matters a lot for rural and Indigenous regions (Jelas et al., 2016). Experts say that teachers who are sensitive to culture feel more satisfied in their careers and are more effective, since they successfully unite academic lessons with students' personal stories. This advantage is even stronger because in Sabah, education helps unite the community, making teachers able to use local resources and parental support (MOE Malaysia, 2022). Even so, not having the same resources prevents schools from fully reaching this potential, explaining the need for policies to institutionalize culturally responsive ways (ST3).

WEAKNESS(W)

One of the biggest obstacles for educators in Sabah noted in the SWOT analysis is shortages in competent teachers joined by overwhelming teaching duties, mostly in rural and geographically remote regions (W4, WO4). The systemic problem happens because good infrastructure and living standards in cities encourage teachers to work there, leaving rural schools with not enough staff (Ministry of Education Malaysia, 2022). This situation causes teachers to teach many students at a time, handle administrative work and combine grade levels which leads them to get tired and offer poorer instruction (Aziz et al., 2021). Digital and technological shortcomings also hinder the provision of online tools and courses mainly to those living in less developed regions (UNESCO, 2021). Likewise, the "Mobile Digital Resource Units" initiative (WO1) tries to fill this gap, but it is still hampered by random problems in carrying out and sustaining its services. A lack of professional development chances also interferes with teachers' ability to handle new pedagogies like hybrid learning and cultural methods, aggravating existing performance gaps (Jailani et al., 2020). According to research such issues are linked to poor achievement among students and a high turnover rate among teachers, especially in the rural areas of Sabah, where a quarter of schools are short on basic requirements (World Bank, 2020). If steps such as promoting AI in lightening teachers' duties (WO4) and embracing mixed training (WO2) are not taken, educational inequality and low quality will persist.

OPPORTUNITY (O)

One important way to boost the performance of educators in Sabah involves using digital tools and forming joint partnerships between government and businesses (both O1 and O4), the SWOT analysis notes. Many low-cost edtechs now available have made it easier than ever to deal with rural-urban gaps, especially through applications like mobile digital units and AI-aided grading (WO1 and WO4). Evidence suggests that if effectively used such technologies might reduce teachers' workload by 30% and can help improve the ways lessons are taught (World Bank, 2022). In addition, if NGOs and tech businesses deliver more services to education, creative techniques like the potential government-NGO teacher training hubs (SO2) could appear, making professional development affordable and available to many teachers. The MDEC (2021) plan points out that Sabah can move past its infrastructure barriers by using cloud platforms and blended forms of training (WO2). Especially, these solutions match Sabah's cultural heritage (SO1, SO3) since they allow for delivering local information in the area's own languages and protecting its traditional knowledge systems (UNESCO, 2022). But for this potential to be realized, issues such as inconsistent internet access in rural regions (T1) and resistance of certain educators to change (W3) should be dealt with (collective meaning of the sentences). If Sabah builds better digital infrastructures and gives teachers the necessary skills (WO2) and these efforts continue to get policy and community support (WT3 and SO3), the state

could set an example for equitable, advanced learning in the region.

THREATS (T)

One of the main challenges harming educator performance in Sabah, noted in the SWOT analysis, is caused by having unstable education policies and not enough funding for rural schools (T1, T3). Changing government policies for education and uneven funding for rural schools in Sabah make it difficult for long-term improvements (World Bank, 2023). These unstable efforts become noticeable in projects such as the suggested teacher training hubs (SO2) or digital resource units (WO1), where gains after new leadership are often not maintained (Ministry of Education Malaysia, 2022). On top of this, rural Sabah schools still struggle with reliable electricity and internet which stops them from using modern tools that could help teachers cope with their work (T2). As a result, 28% of rural schools in Sabah have had their teacher positions sit vacant for a year (UNESCO, 2023), mainly due to educators leaving for urban or international jobs. As a result of all these challenges, teacher morale and effectiveness tend to drop which is visible in lower STEM achievement by Sabah's students (PISA 2022). While having contingency plans (WT1) and giving retention incentives to teachers is useful, without suitable Sabah-specific policies and equal funding solutions, they fall short of solving the problems. This demands a change in the constitution to give local leaders more control over education and put in place extra funds for Sabah's needs, according to studies (Rahim et al., 2023), but this has not occurred up to now due to political inactivity.

(2) What is the best strategy to pursue educators in Sabah in order to increase their job performance based on TOWS-AHP analysis?

1. Implement AI-Powered Workload Reduction (WO4 – 22.3% Priority)

The most critical strategy emerging from the TOWS-AHP analysis is the adoption of AI-driven grading and administrative tools to alleviate excessive teacher workloads (WO4). Research indicates that educators in Sabah spend up to 40% of their time on non-teaching tasks, such as manual grading and paperwork (World Bank, 2023). AI-powered solutions, such as automated essay scoring and attendance tracking, can reduce administrative burdens by 30-50%, allowing teachers to focus on pedagogy and student engagement (UNESCO, 2022). A pilot study in Sarawak demonstrated that AI grading tools improved teacher job satisfaction by 25% while maintaining assessment accuracy (Ministry of Education Malaysia, 2023). However, successful implementation requires training programs (WO2) to ensure educators can effectively integrate these tools. Given that WO4 is the highest-ranked factor (22.3%) in the AHP analysis, prioritizing this strategy offers the most immediate and measurable impact on teacher performance.

2. Develop Culturally Responsive Digital Teaching Modules (SO1 – 16.6% Priority)

Sabah's multicultural student population necessitates culturally adaptive teaching materials (SO1), which ranked as the second-highest priority (16.6%) in the AHP analysis. Studies show that culturally relevant pedagogy improves student engagement by 20-30% in Indigenous and rural communities (Gay, 2018). Educators should collaborate with local NGOs and community leaders (SO2) to co-develop digital modules in native languages (e.g., Kadazan-Dusun, Bajau) that incorporate Indigenous knowledge systems. For example, a 2022 project in Sabah found

that digitized folktale-based math lessons increased Indigenous students' test scores by 15% (Jelas et al., 2022). This strategy leverages Sabah's strength in community ties (SO3) while addressing the weakness of limited rural resources (W1) through scalable digital delivery.

3. Establish Policy Stability Through Teacher-Led Advocacy (WT3 – 14.5% Priority)

The TOWS-AHP analysis identifies policy instability (T3) as a major threat, with WT3 (Policy Stability Task Forces) ranking as the third-highest priority (14.5%). Frequent shifts in education policies disrupt long-term initiatives, such as digital resource deployment (WO1) and teacher training (SO2). Educators should form teacher-led advocacy groups to lobby for Sabah-specific education policies, including decentralized funding and rural incentives (ST2). Research shows that teacher unions in decentralized systems (e.g., Indonesia's post-2014 reforms) have successfully secured 20% higher budget allocations for rural schools (World Bank, 2022). By institutionalizing educator input in policymaking (WT3), Sabah can mitigate the brain drain of teachers (T2) and ensure sustainable reforms.

5. CONCLUSION

With the integrated method combining SWOT/TOWS and AHP, one can create a detailed and evidence-based guide to raise teachers' performance in Sabah. The study outlines both internal and external elements influencing how effectively teaching works and lists advantages such as flexibility in culture and close ties with the local community which create a positive foundation for diversity, while disadvantages like scarce resources and a load of unnecessary work tasks (W4, WO4) negatively affect performance. Gaps in access to education can be tackled with digital education and working with NGOs (O1, O2), but factors such as unstable policies and differences between urban and rural areas (T1, T3) can hinder progress.

AHP determines that giving teachers AI tools to ease their workload (WO4) is the priority and it is followed by using culturally relevant digital materials (SO1) and promoting policy stability through teacher advocacy (WT3). These strategies are tailored for Sabah, using technology to solve problems (e.g., hard bureaucratic procedures) and take advantage of strengths (e.g., people with multicultural backgrounds) as well as new possibilities (e.g., advanced digital networks). The overview emphasizes staging improvements: start with AI solutions, gradually create locally relevant digital materials and introduce policy reforms over the long run to help it last.

Combining qualitative ideas from locals with quantitative tools for prioritization means the study provides a model that can be followed in other places with limited resources. A number of results from this include improving technology, training people in different ways and allowing decision-making in smaller groups to address problems of unfairness in the system. Emphasizing WO4 and SO1 will benefit teachers, result in better student achievements and encourage educational fairness. But its success depends on continued political involvement and getting local communities involved to deal with difficult challenges. It helps build better educational planning methods and gives useful answers that assist Sabah's educators and policy makers in realizing Malaysia's educational equity objectives.

6. FUTURE RESEARCH

It creates a reliable framework that supports further studies by joining the qualitative perspective of SWOT/TOWS analysis with the AHP's quantitative way of classifying priorities. This way of teaching is promising for use in other similar situations, mainly where rural-urban differences, attrition among teachers and policy instability are issues. Additional research can develop this framework in many significant ways. It would be beneficial to use longitudinal studies to monitor how important strategies like AI and culturally responsive teaching are applied, since this could help assess their impact on teachers and students in Sabah. Applying the same technique to other parts of Malaysia or in developing countries can expose the ways in which economic systems are alike and distinct. Furthermore, using new educational technology such as generative AI to make localized content, can help improve the effectiveness of WO4 and SO1. Investigating policy decentralization further may look at how teacher-run campaigns for education reform (such as WT3) impact the way decisions are made locally. Investigating cultural dimensions is important and SO3 recommends using Indigenous ideas to better support students from diverse backgrounds. The decision to assign 22.3% to WO4 reflects that cooperation between teachers, tech experts and policymakers is very important for education. For this reason, it would be helpful to analyze how different sectors cooperate to resolve problems like weak infrastructure and unclear policy guidelines and this could lead to international education change that has real, proven outcomes.

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