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Assessing the Effectiveness of Training Needs Analysis (TNA) in MSME Manufacturing Sectors: A Business and Workforce Development Perspective

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ABSTRACT

Objective - This study aims to assess the effectiveness of Training Needs Analysis (TNA) in Malaysian Micro, Small, and Medium Enterprises (MSMEs) within the manufacturing sector, particularly considering the COVID-19 pandemic. The research seeks to identify key challenges in TNA implementation and determine its role in supporting economic resilience through targeted professional development.

Methodology/Technique – A qualitative approach was employed, using interviews, document analysis, and observations to investigate TNA practices across MSMEs of varying sizes.

Finding – The study examined how TNA is conducted amidst budgetary constraints and strategic misalignment, with a focus on the impact of stakeholder involvement on the process's overall effectiveness. The findings reveal diverse TNA practices within MSMEs and underscore stakeholder engagement's critical yet often neglected role in the TNA process. The study presents a conceptual framework to enhance TNA practices' efficiency and strategic alignment. This framework addresses operational challenges and promotes employee development, offering valuable insights for both practitioners and policymakers.

Novelty – The novelty of this research lies in its emphasis on a structured, participatory approach to TNA, filling a key gap in the existing literature on stakeholder engagement.

Type of Paper: Empirical
JEL Classification: M53, L60, O15
Keywords: Training Needs Analysis; MSME; Manufacturing Sector; Professional Development; Workforce Training; Organizational Strategy; Stakeholder Involvement; Malaysia; Employee Performance; COVID-19 Impact

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1. Introduction

The COVID-19 pandemic has significantly impacted global industries, particularly manufacturing, affecting production, operations, and workforce adaptability (Sohrabi et al., 2020). Countries responded by investing in upskilling and reskilling to support economic recovery, with about 100 nations allocating funds for Training (Nicola et al., 2020).

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In Malaysia, manufacturing remains critical for economic development, with MSMEs comprising 97.4% of businesses in 2021, including 71,612 manufacturing firms (Department of Statistics Malaysia, 2021). The sector's success is closely tied to workforce competency, emphasizing Training Needs Analysis (TNA) to identify skill gaps and foster innovation (Nurmahmudah & Putra, 2020). Globally, training expenditure reached $357.7 billion in 2020, with Malaysia investing RM475 million (Training Magazine, 2020) (HRD Corp, 2021). The need for effective TNA is evident, but many organizations struggle with inadequate data collection, misaligned goals, and limited funding, leading to suboptimal outcomes (Vivian & Jedidah, 2019). Addressing these challenges is essential for aligning Training with organizational objectives and improving long-term performance. This study examines the TNA processes in Johor's manufacturing MSMEs, a region characterized by a skilled workforce and proximity to Singapore. The research offers practical recommendations for enhancing TNA, thereby improving employee competencies and organizational performance. The study provides valuable guidance for policymakers, industry practitioners, and HR professionals in Malaysia and beyond by bridging academic insights with practical implementation. The findings can contribute to developing a highly skilled workforce, crucial for sustaining Malaysia's economic growth in a competitive global environment.

2. Literature Review

Training is essential for organizational development, enhancing knowledge, skills, and abilities (Molinuevo et al., 2020). Effective Training is crucial for competitiveness in today's rapidly evolving corporate landscape (Mohanty et al., 2019). Training Needs Analysis (TNA) is a strategic tool that identifies gaps between current and desired performance, ensuring that training initiatives are aligned with organizational objectives (Blanchard & Thacker, 2023) (Mazhisham et al., 2019). TNA's ongoing data collection and analysis process helps organizations enhance performance and remain competitive in changing environments (Metuge & Olaso, 2020). Without a thorough TNA, organizations risk implementing ineffective training programs that waste resources and fail to address actual needs (Kennedy & Daim, 2010). A systematic TNA begins with organizational analysis, identifying areas where Training is needed to meet strategic goals (Xiang et al., 2020). This is followed by task analysis, focusing on the specific KSAs required for job performance (Chiu et al., 2018). Finally, individual analysis determines the specific training needs of employees to improve performance and contribute to organizational success (Moore et al., 2021) (Rahmat et al., 2019).

TNA distinguishes between problems that can be solved through Training and those requiring non-training solutions (Mukerjee, 2019). It ensures that training investments are directed toward areas of high impact, aligning Training with individual and organizational needs (Aleem et al., 2021). This alignment improves performance, justifies costs, and leads to greater organizational success (Puspita & Nurhalim, 2021) (Sarwandi, 2020).

Prominent TNA models include the Organization-Task-Person (O-T-P) framework and the Performance Analysis Model by Mager and Pipe. The O-T-P model analyzes Training needs at multiple levels—organizational, task, and individual—offering a holistic view of an organization's training requirements (Katzman et al., 2018) (Wieting & Kiela, 2019). The Performance Analysis Model focuses on identifying performance gaps and root causes (Abdullah et al., 2020).

The TNA process involves three levels of analysis: organizational, task, and individual (Mann et al., 2020). Organizational analysis identifies areas for Training to meet strategic goals (Xiang et al., 2020). Task analysis determines the KSAs required for job tasks (Chiu et al., 2018), while individual analysis assesses employee-specific Training needs to enhance overall performance (Moore et al., 2021). This interconnected

process ensures that Training is aligned with strategic objectives, improving job performance and productivity (McGehee & Thayer, 1964).

Effective TNA must be relevant, thorough, and accurate, with full participation from management and stakeholders (King et al., 2022). However, Malaysian MSMEs often face challenges in TNA implementation due to resource constraints and a lack of strategic planning (Purnell, 2020). Properly executed TNA ensures training programs are aligned with organizational goals, enhancing both employee performance and organizational success (Mazhisham et al., 2019) (Rossett, 1997) (Rajan, 2018).

The conceptual framework for this study, based on (Ludwikowska, 2018), integrates organizational, task, and individual analyses. It guides the evaluation of TNA practices in Johor's MSMEs, aiming to improve training alignment with organizational goals and providing recommendations for enhancing training effectiveness (Kerle et al., 2019). The framework supports the systematic collection and analysis of data related to training needs in MSMEs, offering insights into how TNA can enhance performance and competitiveness (Yildirim et al., 2019).

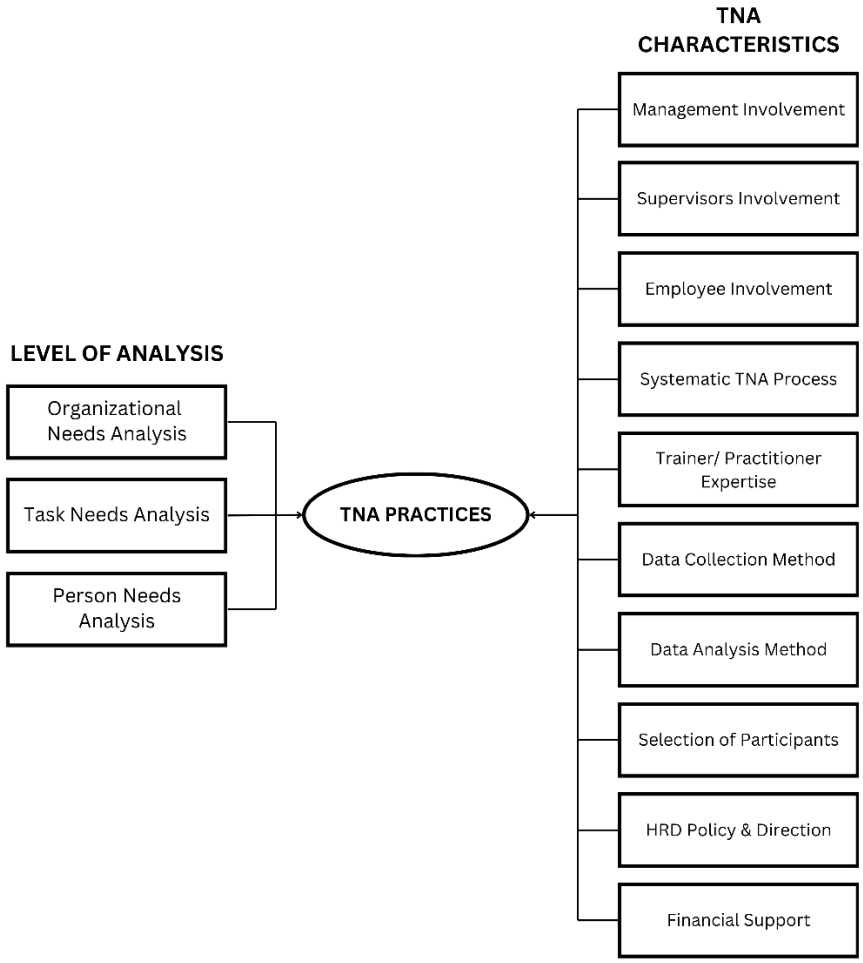


Figure 1. Conceptual Framework

3. Research Methodology

3.1 Research Approach and Design

This study employed a qualitative research approach within the interpretive paradigm to understand participants' subjective experiences with the TNA process in selected manufacturing companies in Johor, Malaysia. The interpretive lens facilitated an exploration of participants' perspectives through in-depth interviews, participant observations, and document analysis. An inductive approach allowed patterns and insights to emerge naturally from the data. A mono-method qualitative design, combined with a cross-sectional approach, was used to investigate the TNA process at a specific time, ensuring the study's validity and reliability. Data collection methods included interviews, observations, and document analysis, gathering detailed information aligned with qualitative research practices.

3.2 Sampling and Data Collection

Purposive sampling was employed to select 12 participants from four manufacturing companies in Johor, including HR personnel, trainers, and trainees, each with at least five years of experience in the TNA process. The sample size was determined by data saturation—when no new information emerged. Semi-structured interviews were the primary data collection method, allowing flexibility to explore participants' responses in depth. Observations in the natural settings of the selected companies provided contextual insights, while document analysis of TNA reports, training materials, and performance appraisals supplemented the data. This triangulation of methods provided a comprehensive understanding of TNA practices.

3.3 Data Analysis and Interpretation

Interpretative Phenomenological Analysis (IPA) was used to analyze participants' subjective experiences, aligning with the study's philosophical and methodological framework. The analysis began with data reduction, systematically organizing the data to develop descriptive explanations and models. Data saturation indicated that no new information was emerging, confirming the comprehensiveness of the dataset. The data were categorized into five main themes: interviewee demographics, current TNA practices, decision-making, effectiveness, and challenges. Conclusions were drawn by carefully interpreting patterns and themes within the data. The rigorous application of IPA, combined with systematic data reduction, saturation, and display techniques, provided a robust framework for analyzing the effectiveness of TNA in the selected manufacturing companies.

4. Results

4.1 Demographics of Participants

Participants included senior executives, trainers, and trainees from manufacturing companies in Johor, Malaysia. Among senior executives, 50% held Bachelor's degrees, 25% Master's, and 25% diplomas. Trainers were more educated, with 75% holding Master's degrees and 25% Bachelor's degrees. Trainees had diverse educational backgrounds: 50% had diplomas, 25% had bachelor’s degrees, and 25% had only high school education. Senior executives were predominantly aged 45 and above (75%), while trainers and trainees were younger, split between the 25-34 and 35-44 age groups.

4.2 Current TNA Practices in Manufacturing Companies

Table 1 summarizes current TNA practices. Performance appraisals were the most common method used by 100% of senior executives, trainers, and trainees. Job descriptions were also widely used with special

training committees and group interviews. Direct observation, questionnaires, and KSAs tests were less common. At the organizational level, goals and objectives were the primary data sources for trainees (100%) and senior executives (75%). Job descriptions, specifications, and performance standards were consistently used at the operational and individual levels. Perceptions of TNA showed universal agreement on its importance in aligning Training with organizational needs and ensuring cost-effectiveness, although trainees were more confident in TNA's ability to solve current problems.

Table 1. Current TNA Practices of Participant Manufacturing Companies

	Senior Exec. (N = 4)		**Trainers** (N = 4)		**Trainees** (N = 4)	
	Yes	**%**	**Yes**	**%**	**Yes**	**%**
Method of Need Assessment						
Performance appraisal information or results	4	100	3	75	4	100
Examining the job descriptions of employees within the organisation.	3	75	4	100	4	100
Determination through special training committee	3	75	2	50	3	75
Group interviews with managers and supervisors	3	75	3	75	3	75
Direct observation	2	50	3	75	2	50
Questionnaires	2	50	2	50	3	75
Skills, Knowledge, and Abilities (KSAs) tests	2	50	2	50	1	25
Personal face-to-face interviews with employees	1	25	2	50	2	50
TNA Data Collection Criteria Selection Method (senior executives and trainers only)						
Top management preferences	3	75	3	75	-	-
Employees' acceptance	3	75	3	75	-	-
Expertise of the HR Staff	3	75	1	25	-	-
Organizational culture and values.	3	75	2	50	-	-
Cost-effectiveness	2	50	3	75	-	-
Time required	2	50	4	100	-	-
Ease of use	2	50	2	50	-	-
Sample size	2	50	2	50	-	-
Confidentiality	2	50	1	25	-	-
Sources of Data in Different Levels (senior executives and trainers only)						
Organizational Level						
Organizational goal and objectives	3	75	4	100	-	-
Management request	2	50	3	75	-	-
Skills inventory	2	50	1	25	-	-
Changes in the system and sub-system	2	50	3	75	-	-
Workforce inventory	2	50	1	25	-	-
Organizational climate indices	1	25	1	25	-	-
Operational Level						
Job description	3	75	4	100	-	-
Job specification	3	75	4	100	-	-
Performance standards	3	75	4	100	-	-
Relevant literature concerning the job	1	25	1	25	-	-
Individual Level						
Attitude survey	3	75	1	25	-	-
Performance appraisal data	3	75	4	100	-	-
Supervisors' suggestion	3	75	3	75	-	-
Skills, Knowledge, and Abilities (KSAs) test results	2	50	3	75	-	-
Assessment survey	2	50	1	25	-	-

Overall Perceptions Regarding TNA Practices						
TNA emphasized in organization's training practices to ensure training effectiveness	4	100	4	100	4	100
TNA ensures that organizational needs are linked with employees' needs	4	100	4	100	4	100
TNA determines the 'where,' 'what' and 'who' decisions of Training	4	100	4	100	4	100
The management of this organization believes that TNA process is cost-effective	4	100	4	100	4	100
The management of this organization believes that TNA is central for improving the training effectiveness	4	100	4	100	4	100
Top managers are committed to the TNA function	4	100	3	75	3	75
It provides a benchmark for evaluating Training and records the justification for the training budgets.	3	75	4	100	4	100
TNA is conducted to differentiate performance problems caused by employees' lack of skills, knowledge, and abilities (KSAs) and problems caused by other factors.	3	75	3	75	4	100
The manufacturing company use TNA methods to produce precise, relevant, specific data on performance discrepancies.	3	75	3	75	4	100
The manufacturing companies use TNA methods to make it possible to distinguish between Training that employees need and training that they want	3	75	2	50	3	75
The present volume of TNA is adequate to solve your current problems	3	75	2	50	4	100
Training needs will only be fulfilled if they are in line with the organization's strategic needs	3	75	1	25	4	100

4.3 Decision-Making Processes in Training

Supervisor recommendations were the most influential factor in training decisions, cited by 100% of trainees and senior executives. Employees often applied for Training on their initiative (75%), while directed Training was common among trainees and trainers (75%). Annual performance appraisals, boss opinions, and training committee decisions were significant criteria across all groups. Trainees highlighted job performance enhancement and certification as key motivations for attending Training. External Training was the most common form of Training (100%), followed by off-the-job (75%) and on-the-job Training (50%). Table 2 outlines these processes.

Table 2. Decision-Making Processes of Participant Manufacturing Companies

	Senior Exec. (N = 4)		**Trainers** (N = 4)		**Trainees** (N = 4)	
	Yes	**%**	**Yes**	**%**	**Yes**	**%**
Method of selecting employees for Training						
Supervisor's recommendation	4	100	3	75	4	100
Employees applied to attend (employees' desire)	3	75	3	75	3	75
Employees were directed to attend	3	75	2	50	3	75
Suggestions in performance appraisal forms	3	75	3	75	3	75
Discussing the course with the training manager and putting their names forward	2	50	3	75	0	0
Employees were chosen by their colleagues to represent their department	1	25	2	50	1	25
Employee sent as replacement for someone who could not attend	0	0	0	0	1	25

Criteria for selecting employes for Training						
Their annual performance appraisal	3	75	3	75	4	100
The views of their boss	3	75	3	75	4	100
The decision of the training committee	3	75	3	75	3	75
Their academic qualification	3	75	3	75	4	100
Their position	3	75	3	75	2	50
The length of service	2	50	2	50	2	50
Their seniority and willingness	1	25	2	50	2	50
Reasons to attend training programs (trainees only)						
	Yes			**%**		
To enhance the performance of my current job	4			100		
To get a certificate	4			100		
To acquire new knowledge and skills for promotion	4			100		
To meet people	3			75		
The course was compulsory	2			50		
Forms of training programs (trainees only)						
	Yes			**%**		
External Training outside the organisation	4			100		
Off the Job Training within the organisation	3			75		
On Job Training	2			50		

4.4 Effectiveness of TNA

Table 3 shows that TNA was generally effective, with 100% of senior executives and 75% of trainers agreeing that Training aligned with strategic plans and organizational culture. All participants confirmed the presence of ongoing training plans and that employees were motivated to participate in TNA. Senior executives were more consistent in reviewing job descriptions before training decisions, while trainers were less certain. Employee skill levels were assessed before Training by 100% of senior executives and 75% of trainers, and 75% agreed on the importance of cost-effectiveness in TNA.

Table 3. Effectiveness of Training Analysis in Participant Manufacturing Companies

	Senior Exec. (N = 4)		**Trainers** (N = 4)	
	Yes	**%**	**Yes**	**%**
The Training was consciously linked to the manufacturing companies' strategic plans	4	100	3	75
Training objectives are in harmony with the manufacturing companies' culture	4	100	4	100
You seek the support and commitment from Top management to provide all the facilitation to training activities	4	100	3	75
The organisation has a clear ongoing plan for Training	4	100	4	100
The job description of the employee's job is reviewed prior to deciding on the training program to be undertaken by the employee.	4	100	2	50
Policies and plans related to Training are flexible and adaptable to changing circumstances	4	100	3	75
Employees are motivated to participate in the TNA process	4	100	4	100
The job-related competency requirements are ranked according to their importance	4	100	4	100
The current skill/competency level of employees is assessed before deciding on the training programme to be undertaken by the employee	4	100	3	75
You have access to the manufacturing companies' objectives and strategies	4	100	4	100
You have decided on the desired competency level you expect an employee to	4	100	3	75

reach after Training				
You determined the knowledge, skills and attitudes an employee must have to perform the job successfully	4	100	3	75
You emphasize cost effectiveness training to assess the effectiveness of Training needs analysis	3	75	3	75
The relationship between the training staff/external training specialists and line managers is based on mutual understanding and an exchange of ideas to solve problems related to human resource development	3	75	3	75
Before considering Training, you carefully assessed if the problem could have been somewhere else (such as the work environment, the tools, and reward systems)	3	75	4	100

4.5 Challenges in Conducting TNA

Challenges in conducting TNA included unreliable data, insufficient personnel, and time constraints. Organizational culture, including favoritism and entrenched values, obstructed effective TNA execution. Communication gaps between trainees and management further hindered the process: outdated technology, limited data collection and analysis, misaligning Training with actual needs. Respondents emphasized the need for a more structured approach, improved communication, and alternative TNA techniques to enhance the process. All interviewees agreed on the importance of increased employee involvement and better alignment of Training with organizational goals.

5. Discussion

5.1 Current Methodologies and Assessment Methods in TNA Practices

The reliance on performance appraisals by all senior executives (100%) and most trainers (75%) reflects traditional TNA frameworks, such as (McGehee & Thayer, 1964), where individual performance is a key determinant of training needs. However, this method has limitations, as (Goldstein, 1993) notes, due to potential biases such as favoritism. Job description analysis, employed by all trainees and trainers, also follows task analysis theory (Saks et al., 2016), but outdated or incomplete job descriptions can cause misalignment between Training and actual job requirements (Noe, 2013). The use of direct observation and questionnaires, though less frequent, offers valuable real-time insights and qualitative data but faces constraints in large-scale applications due to resource demands (Blanchard & Thacker, 2023). Despite their effectiveness in identifying competency gaps, KSAs tests were underutilized by senior executives and trainers, favoring more traditional methods. This indicates a need for a more comprehensive TNA approach that integrates diverse methods to capture the evolving needs of the workforce fully.

5.2 Supervisor-Trainee Communication and Stakeholder Involvement in TNA

Effective supervisor-trainee communication is crucial in ensuring training programs address actual needs. The study revealed that only 25% of trainees regularly discuss their training needs with supervisors, risking a disconnect between training efforts and employee development. The study also highlights the role of stakeholders in TNA decision-making. While all senior executives (100%) are involved, only 50% of trainers participate actively in needs assessments, potentially weakening training design (Blanchard & Thacker, 2023). Trainees, despite being the primary beneficiaries of Training, are largely excluded from early-stage discussions, which could limit the effectiveness of TNA in addressing their specific needs (Goldstein, 1993). Enhancing communication and increasing involvement across all stakeholder groups, particularly trainees, is critical to ensuring training programs align with organizational goals and employee needs.

5.3 Challenges in Conducting TNA

The study identified several challenges to effective TNA implementation in manufacturing companies, including a lack of specialized personnel, time constraints, and organizational resistance. General HR staff, often tasked with conducting TNA, may lack the expertise required for comprehensive assessments (Noe, 2013). Time pressures exacerbate this issue, leading to rushed analyses that may fail to capture the full scope of training needs. Cultural barriers also impede the process; rigid corporate structures discourage open communication, making it difficult to obtain accurate feedback from employees (Saks et al., 2016). Technological constraints further hinder TNA efforts, with many companies lacking the infrastructure to support advanced data analytics, thus relying on traditional methods that may not provide comprehensive insights (Goldstein, 1993). Personal relationships and favoritism within organizations also influence training decisions, skewing TNA outcomes and detracting from objective assessments (Blanchard & Thacker, 2023). Addressing these challenges requires a shift toward more objective, systematic TNA processes supported by modern technology and a culture of openness.

5.4 Strategic Alignment of TNA with Organizational Goals

The alignment of TNA with organizational goals is vital for ensuring that Training contributes to long-term success. The study found that 100% of senior executives and 75% of trainers consciously link training activities to strategic objectives, reinforcing the importance of TNA in achieving organizational goals (Noe, 2013). Ensuring this alignment addresses immediate skills gaps and supports broader business strategies. Additionally, the study emphasizes the importance of cultural alignment, with training objectives harmonizing with organizational values, which facilitates employee acceptance and behavioral change (Saks et al., 2016). The strong commitment of top management to supporting TNA processes further enhances its effectiveness, ensuring Training aligns with strategic direction and fosters organizational growth (Goldstein, 1993). Maintaining this alignment requires continuous evaluation and adaptation of TNA practices to reflect changing organizational needs and external factors.

5.5 Recommendations for Improving TNA and Ensuring Continuous Improvement

To improve the effectiveness of TNA, the study recommends enhanced communication, a more structured TNA process, greater employee involvement, and continuous evaluation. Clear and consistent communication across all levels of the organization is essential for accurately identifying training needs and aligning them with strategic objectives (Saks et al., 2016). Formalizing the TNA process through standardized procedures and documentation will ensure that needs assessments are consistently accurate and reliable, facilitating better integration with HR functions like performance management (Noe, 2013). Increasing employee involvement in the TNA process will lead to more relevant and effective training programs, as employees bring valuable insights into the specific challenges they face in their roles (Goldstein, 1993). Finally, continuous evaluation and adaptation of the TNA process are crucial for keeping Training aligned with organizational goals and responsive to external changes, such as technological advancements and shifts in the competitive landscape (Blanchard & Thacker, 2023). By implementing these recommendations, manufacturing companies can enhance their TNA practices, ensuring that training programs are well-targeted, aligned with strategic goals, and adaptable to future challenges.

6. Conclusion

This study offers a comprehensive exploration of the effectiveness of Training Needs Analysis (TNA) within selected manufacturing companies in Johor, Malaysia, highlighting both strengths and challenges. TNA is crucial in aligning Training with organizational objectives, especially in MSMEs. However, the

findings reveal that TNA often falls short due to ad hoc practices, limited stakeholder engagement, and organizational and cultural barriers. The reliance on reactive TNA approaches, while flexible, lacks the strategic depth necessary for long-term success. The study underscores the need for a systematic, process-oriented approach to TNA, integrated into strategic planning and characterized by ongoing, participatory assessments involving all relevant stakeholders. A key challenge identified is the insufficient involvement of employees and line managers in the early stages of TNA, leading to misaligned Training and diminished effectiveness. To address this, the study advocates for a more inclusive TNA process that engages stakeholders through needs assessment and program implementation. Additionally, organizational culture and resource constraints further hinder effective TNA. Rigid structures and a lack of dedicated resources often result in suboptimal training outcomes. The study suggests fostering a culture that values continuous learning and recognizes the strategic importance of TNA. The study proposes a conceptual framework to enhance TNA effectiveness within MSMEs in response to these challenges. This framework emphasizes strategic alignment, comprehensive data collection, and continuous evaluation, integrating organizational, task, and individual analyses to ensure training programs are relevant, targeted, and adaptable.

Beyond the manufacturing sector, this research offers valuable insights for TNA practitioners and policymakers across industries, contributing to the broader discourse on workforce development and organizational strategy. It calls for organizations to adopt more strategic approaches to TNA, recognizing its importance as a driver of employee performance, innovation, and sustained competitive advantage. In conclusion, this study reaffirms the importance of effective TNA as a strategic tool for organizational growth. By adopting a more systematic, inclusive, and aligned approach to TNA, organizations can enhance the relevance and impact of their training programs, ensuring they meet current and future organizational needs. Ultimately, this research deepens the understanding of how TNA can support organizational development, particularly within the dynamic and competitive landscape of the Malaysian manufacturing sector.

Author Contributions

- **Jayakumar Raj:** Conceptualization, Methodology, Data Curation, and Supervision.
- **Balakrishnan Muniapan:** Investigation, Resources, and Writing – Review & Editing.
- **Logaiswari Indiran:** Writing – Original Draft, Formal Analysis, and Visualization.

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