

## Research Article

# STEAM-ME: A Novel Model for Successful Kaizen Implementation and Sustainable Performance of SMEs in Vietnam

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The current trend of international integration urges every business organizations to continuously improve their competitive advantage for their survival and sustainable growth. And Kaizen has been a preferable approach in practice. Due to the special role of SMEs in the Vietnam economy, improving their competitiveness is critical. Thus, this study is aimed at identifying determinants of the successful Kaizen implementation and sustainable performance so that SMEs can have proper actions and prioritize their operations within their available resources. Through a formal survey of 213 participants from 62 SMEs which have been successful in implementing Kaizen and appropriate statistical analyses, seven important determinants have been identified, namely, (1) supports from senior management; (2) training; (3) environment; (4) assessment; (5) motivation; (6) mindset; and (7) engagement of all members in the organization. Among them, “mindset” is newly proposed in this study through a qualitative research and found as crucial component in the model. The finding obviously fulfills the existing literature. Moreover, the first letters of the identified factors are orderly congregated as “STEAM-ME” which is a novel model for the successful Kaizen implementation and the sustainable performance of SMEs in Vietnam. “STEAM-ME” implies that organizations need to have a new airflow as “steam” to make all of its members refreshed and brimful of energy to gain significant success in implementing Kaizen, and improve their business performance as well as competitive advantage for their sustainable development. Notably, the novel model can efficiently demonstrate organic relationships among its components which all have positive and significant impacts on the successful Kaizen implementation and sustainable performance of SMEs in Vietnam.

## 1. Introduction

Nowadays, the inevitable globalization has offered several opportunities and many challenges to almost every business organization. Thus, being competitive on the marketplace is critical for their survival and sustainable growth [1]. To improve their competitiveness, different businesses may have different strategies; among them, continuous improvement for operational excellence has been preferably used in practice [2, 3]. However, applying the Kaizen concept for continuous improvement has been an attractive choice [4–6] because it significantly helps to increase quality, improve level of efficiency, and reduce waste and production cost for business excellence [7]. Thus, Kaizen is one of the most common “Japanese business terms” [8]. The Kaizen approach has been successfully implemented in different industries

in several countries regardless of business sectors. Homma [9] and Costa & Filho [10] pointed out that Kaizen can be effectively used not only for industrial development but also for productivity improvement in public services and utility management such as energy or healthcare; or non-firm-related use; or even the improvement of environmental performance [11–13]. The applicability of Kaizen and its practical benefits in terms of inventory reduction, customer satisfaction, lead time, and waste reduction, etc. have been validated by different researchers worldwide, such as Chahal et al. [14], Marodin et al. [15], Gupta et al. [16], Belekoukias et al. [17], Fullerton et al. [18], Ingelsson & Mårtensson [19], Prashar [20], Teehan & Tucker [21], and Dora et al. [22]. Consequently, Lozano et al. [8] concluded that Kaizen has economic and environmental implications because it closely relates to organizational systems and business strategies

TABLE 1: Criteria in identifying types of SMEs in Vietnam.

Areas	Criteria	SME types under Decree 39/2018			SME types under Decree 56/2009		
		<i>Micro</i>	<i>Small</i>	<i>Medium</i>	<i>Micro</i>	<i>Small</i>	<i>Medium</i>
Agriculture, forestry, aquaculture, industry and construction	No. of employees ( <i>e</i> )*	≤ 10	≤ 100	≤ 200	≤ 10	≤ 200	≤ 300
	Total capital ( <i>BV</i> )**	≤ 3	≤ 20	≤ 100		≤ 20	≤ 100
	Annual revenue ( <i>BV</i> )**	≤ 3	≤ 50	≤ 200			
Trading and Services	No. of employees ( <i>e</i> )*	≤ 10	≤ 50	≤ 100	≤ 10	≤ 50	≤ 100
	Total capital ( <i>BV</i> )**	≤ 3	≤ 50	≤ 100		≤ 10	≤ 50
	Annual revenue ( <i>BV</i> )**	≤ 10	≤ 100	≤ 300			

Notes: \* employees; \*\* Billion Vietnam Dong.

by engaging all levels of management and employees for continuous improvement.

On the other hand, the important role of small and medium enterprises (SMEs) in most socioeconomic activities has been well recognized globally; thus, it is one of the common topics discussed in multilateral cooperation forums and meetings, such as Asia-Pacific Economic Cooperation (APEC), Organisation for Economic Cooperation and Development (OECD), Asia-Europe Meeting (ASEM), and Association of Southeast Asian Nations (ASEAN) [23]. Especially, its importance is further affirmed in APEC 2017 as it is one of their four key priorities, “*Strengthening Micro, SMEs’ Competitiveness and Innovation in the Digital Age*”.

In Vietnam, the number of SMEs accounts for about 97.5% of 561,064 enterprises of all types operating in Vietnam [24]. The new definition of SMEs has been issued in Article 6 of Decree No. 39/2018/ND-CP by the Government and comes into effect since March 11th, 2018. SMEs can be classified into three categories depending on two criteria: (1) annual average number of employees contributing Social Insurance (No. of employees) and (2) annual revenue or total capital registered. These criteria are somehow different from previous Decree 56/2009/ND-CP. Table 1 briefly presents details of these categories mentioned in the two Decrees.

Practically, SMEs not only contribute over 40% of national GDP and 17.26% of the annual national budget but also employ more than 50% workforce [23]; consequently, SMEs are an important contributor to the development of Vietnam economy. Comparing between 2017 and 2016, we found that the number of medium enterprises increased by 23.6%, small ones increased by 21.2%, and micro ones increased by 65.5%. But there were also more than 60,660 enterprises bankrupted in 2016 [23], indicating that SMEs are vulnerable in the competitive marketplace and current economic context due to their limited resources and capacity [25].

However, with the small and medium business scale, SMEs have their advantages in flexibly renovating themselves and adopting new management approaches as well as easily adapting to the changes in their business environment. Therefore, when advanced management approaches such as

Kaizen and 5S are introduced, they are always willing to learn and apply as much as they can to improve their operational efficiency, effectiveness, and productivity [25]. In the current context of international integration, the improvement has become notably mandatory since the introduction of ASEAN Economics Community (AEC) in 2015 because the free movement of goods, services, and investments as well as freer flow of capital and skills among the ASEAN countries results in more intensive competition on the marketplace. In such competitive environment, providing good products/services at reasonable prices becomes critical to the survival and growth of the enterprises. And Kaizen has been considered as an effective tool to improve the productivity, cost-effectiveness, profitability, efficient use of capital, reduction of operating time, and competitive advantage [26].

Kaizen has been well transferred to Vietnam since early 1990s. Over the years, more and more companies located throughout Vietnam are trying their best to implement Kaizen in their operations. Though there are some differences in the practical implementation of Kaizen among Japanese-owned companies, Japanese-joint companies, and foreign and local ones, many of them have well recognized the importance of Kaizen for their development. From the training workshops on Kaizen organized in Vietnam, practitioners find that Kaizen approach is suitable to be widely applied across the industrial enterprises in Vietnam because it is considered simple and inexpensive. However, its practical implementation is actually more complex than expected. Consequently, some of them fail to implement Kaizen in their companies but some with successful implementation have gained significant benefits in terms of increased efficiency and productivity. Therefore, this study is aimed at identifying key determinants of the successful Kaizen implementation and their impacts on the sustainable performance to encourage more and more SMEs in Vietnam to effectively deploy Kaizen approach to improve their competitiveness.

The rest of this paper is organized as follows: Section 2 reviews relevant literature about Kaizen and organizational performance as well as key factors affecting them before research hypotheses and model are proposed in this study.

Methods used for data collection and data analysis are explicitly presented in Section 3 while empirical results are explained in Section 4. Section 5 provides detailed discussions and managerial implications departed from the obtained results. Conclusions make up the last section.

## 2. Literature Review

To achieve the above-mentioned research objectives and support the following analyses and discussions, this section will present some key terminologies, such as “Kaizen” and “sustainable performance”, and cover some fundamental literature about (1) sustainable performance of an organization; (2) briefs about Kaizen; (3) Kaizen implementation and measures of successful Kaizen implementation; (4) relationship between Kaizen implementation and organizational performance; and (5) factors affecting the success of Kaizen implementation. Through such presentation, research hypotheses and research model investigated in this study are accordingly proposed.

*2.1. Sustainable Performance.* Organizational performance refers to the extent to which an organization succeeds or achieves its objectives and strategies [27]. Proper management of performances helps organizations to effectively capture their current situation, monitor their progress in achieving their goals, and identify latent causes obstructing their success [28]. Current context of fierce competitive marketplace urges organizations to strive for their long-term development through “sustainable performance” which is differently defined by different scholars. For example, Artiach et al. [29] defined it as the degree to which an organization incorporates its concerns in terms of profit, environment, people, and governance into its operations for ultimate impacts on the organization and society, whereas, Stanciu et al. [30] defined it as the ability of organizations to satisfy the needs and expectations of their stakeholders based on long-term, balanced, and effective management with proper awareness of their staffs through their learning and applying of improvements and innovations; UBS [31] claimed that sustainable performance focuses on long-term and consistent benefits to stakeholders.

Literally, sustainable performance and sustainability have been interesting topics in different research areas as found in [32–38]. Several researchers, such as Long & Nguyen [39], Norazlan et al. [40], Moldan et al. [41], and Schoenherr [42], agreed that the sustainable performance is measured with three dimensions, namely, (1) economic performance, defined as the extent to which an organization improves its operations, market, and financial results; (2) environment performance, defined as the extent to which an organization improves its control of pollution and its resource efficiency; and (3) social performance, defined as the extent to which an organization improves its practical outcomes related to its employees and community. Considered as the key pillars of triple bottom line theory, balancing these dimensions is critical to improve organizational competitive advantages [43].

*2.2. Briefs about Kaizen.* As human always wants to become better and better, consistent improvement is a fundamental need. Searching for ways to improve business operations led to the term “Kaizen” which combines two separate words: “Kai” (change) and “Zen” (good/better). Thus, “Kaizen” is commonly understood as “change for the better” or “continuous improvement” [26, 44], “a philosophy guiding individuals and organizations to do better achievements in the long term” [45] or “self-sacrifice for everyone’s betterment”. Over the last 30 years, the term “Kaizen” has become a popular management concept in the 21st century [45–47]. Kaizen can be used in all aspects of life, including business organizations [48, 49]. Nowadays, Kaizen is considered as grand-scale, companywide, daily, and everywhere improvement made by everyone. Fundamentally, Kaizen is aimed at transforming work area and developing employees for specific targets in an escalated timeframe [49–51] by using cross-functional teams, training employees, and rotating jobs [51, 52] so that the workforce can be subtly controlled to avoid latent conflicts with the management [50]. According to Lemma [26], Kaizen is a firm-level process working as a strategic tool to improve the productivity in manufacturing firms. It is actually the core of “monozukuri” which means “making things” to satisfy customers. By focusing on three areas for improvement, namely, Muda (waste), Mura (discrepancy), and Muri (strain), if implemented correctly, Kaizen is a donor to make employees have more positive attitude towards their work and enhance the self-esteem and the awareness of their responsibilities towards their workplace, their working processes, and ways to improve them because they are always encouraged to share their ideas to make the existing standards better [52].

Practically, Kaizen is a process-oriented method to make small, immediate, and incremental improvements in work standards generated repeatedly by workers [44]. Thus, Kaizen mainly asks for the engagement of all members in the improvement effort [48, 53], and there is no need for a huge capital investment nor an enormous preparation at one time. According to Lozano et al. [8], Kaizen philosophy is based on three pillars: (1) preventing waste, (2) organizing workplace, and (3) making things standardized. Therefore, according to Jurburg et al. [54], Kaizen is an effective tool to (1) cheaply abolish or lessen hidden costs resulting from undue waste; (2) improve operational performance in terms of high-quality products, low production cost, and short service time; (3) optimize operations with minimum downtime which is irrecoverable [55]; and others. Consequently, Kaizen is considered as a good strategy for any organization to improve its competitive advantages.

### 2.3. Kaizen Implementation and Measures of Its Success

*2.3.1. Kaizen Implementation.* Kaizen is a companywide process which involves all people from high-level management to front-line employees. The former provides commitment and supports to motivate the latter who directly performs the “continuous improvement”. In implementing Kaizen in practice, a Plan-Do-Check-Act (PDCA) cycle is usually

used to deal with not only unit-functional but also cross-functional problems in their operations. Specifically, areas for improvement must be firstly identified (planning phase) before corrective actions are taken (doing phase). In the doing phase, also called the Kaizen implementation, several techniques such as 5 Whys [56] and Value Stream Mapping (VSM) [57–59] can be used to fully capture the root causes of the problems, for example, the quality level, scrap/rework rate, layout performance, and amount of certain resources used in each stage of the process. From the identified causes, proper improvement solutions should be considered and accordingly implemented.

In the checking phase, we need to closely monitor the impacts of the Kaizen solutions on the detected problems and determine whether positive results can be observed as expected. If the solutions are satisfactory, in the acting phase, we should formally set the Kaizen activities as new standards and move forward; otherwise, an adjustment in terms of solutions, implementing methods, etc. should be reconsidered in the next cycle. Once Kaizen is successfully implemented in an organization, innovation becomes its cutting-edges in strengthening its competitiveness, and the Kaizen activities should be standardized and turned into permanent tasks in their processes [26].

Literally, Kaizen is a slow and long-term process of changes rather than a sudden intervention [60]. Implementing Kaizen should first begin with reviewing the existing processes and identifying areas for improvement before providing proper training, tools, and structure to employees. Then, employees are encouraged to become aware of all possible problems in their daily operations and think about feasible improvement solutions. Gradually, they likely take their mental ownership of their individual processes; finally, they consider improving the processes as a critical part of their responsibility.

Though the Kaizen principles are quite easy to be fully understood, there are still several challenges in its implementation in practice due to the difficulties in managing Kaizen activities [61–64]. Several obstacles have been found, such as resistance to change among mature workers, the abstraction of “continuous improvement” concepts [65], the absence of compensation or reward, lack of proper training for employees and long delays in getting suggestions processed [66], lack of resources to run Kaizen activities, lack of focus due to business pressure and lack of understanding of the need to change [64], lack of knowledge, and poor employee participation [22]. Thus, innovation and education are key components in Kaizen implementation [12].

*2.3.2. Measures of Successful Kaizen Implementation.* Though there have been several studies in identifying factors affecting the success of Kaizen implementation, there are a few effective approaches to measure the overall success. For instance, “Overall Equipment Effectiveness” (OEE) proposed by Nakajima [67] focused on equipment utilization while Domingo & Aguado [68] proposed a more comprehensive metric, “Overall Environmental Equipment Effectiveness” (OEEE). However, through group discussions with leaders

from six SMEs successfully implementing Kaizen, they failed to deploy OEEE in measuring the success. Thus, further discussions were conducted to explore what measures should be used. Based on the qualitative research, there are four measures suggested: (1) effective usage of existing resources (including space utilization) for incremental and continuous improvement; (2) increased efficiency by optimizing operations and processes with properly arranged layouts of work area and work flows to minimize superfluous movement or operations as well as production costs; (3) safer, cleaner, and better-organized working environment perceived by relevant stakeholders; and (4) positive mindset of “continuous improvement” among employees. The improvement level of these measures is evaluated in 5-Likert scale as explained in Section 3.

*2.4. Relationship between Kaizen and Sustainable Performance.* Several scholars worldwide have made special efforts to promote the benefits of Kaizen across different countries. Existing researches from different industries clearly show that successful implementation of Kaizen brings several benefits, including reducing scraps, reworks, inventory, unnecessary movement, production lead time, and failures in tools/machinery and improving product quality, productivity, delivery, floor security and safety, employees’ motivation, responsibility, cross-communication, and teamwork, among others [69, 70]. Therefore, Kaizen helps a business firm to satisfy its stringent customers’ requirements and expectations, gaining more trusts from its stakeholders, and boosting its competitive advantages through the increase in customer satisfaction, employee satisfaction, productivity, and financial performance [71]. Moreover, as public are paying more and more attention to environmental protection and social impacts, successfully implementing Kaizen will help organizations to achieve “green attributes” which were found to have positive and direct influence on business performance of industrial manufacturers [72]. Consequently, successful Kaizen implementation helps to sustain organizational performance [40, 73].

*2.5. Factors Affecting the Success of Kaizen Implementation.* Existing literature shows that there are a number of factors affecting the success of Kaizen implementation. For example, an open working environment that allows effective cross-communication and encourages innovation is critical for a better understanding between management bodies and their employees as well as the sharing of improvement ideas for easier and faster processes based on their practical experience [74–76]. In addition, strong commitments from top management in implementing Kaizen with clear approaches, strategies, policies, and targets also play significant roles in sustaining improvement actions [64, 74] and building Kaizen culture because they help to effectively support, direct, and allocate relevant resources [77]. In particular, this study conducted a thorough search of more than 200 research reports published in the last two decades on key databases such as ScienceDirect, Elsevier, EBSCOhost, Springer, and Emerald. For brevity, only some reports cited in main texts

are listed in the References while many others are listed in Appendix I. The search well gives the rational validation to the six key affecting factors presented in Table II.1 (Appendix II). Similar approaches can be found in [70, 78–81]. The identified determinants are clarified in the following subsections.

*2.5.1. Supports from Senior Management.* As continuous improvement is the core of Kaizen, senior leaders must act as the most vital driving force to make the improvement process effectively implemented with their strong supports to ensure the full and active participation of every member [54, 82]. Such supports, including spiritual and physical ones as well as necessary resources allocated, can be expressed in verbal or written commitments, statements, policies, plans, or even direct involvement in following up the progress of Kaizen and related practical activities [47, 74]. The supports and commitments should be well formulated and effectively articulated as a motivational factor for employees to perform better [83] and more engage in the continuous improvement [51]. Further evidence of this factor can be found in [81, 84–86]. It is found that such involvement from senior leaders is the most fundamental factor affecting the success of continuous improvement programs [87–89].

With this factor, the following hypotheses will be investigated:

- (i) H1: Support from senior management has positive impacts on the successful Kaizen implementation.
- (ii) H2: Support from senior management has positive impacts on the sustainable performance.

*2.5.2. Training.* Literally, the importance of training and education for the success of Kaizen has been well validated by several scholars worldwide [52, 74, 90, 91] because it is critical for not only providing “need-to-know” basis but also consolidating human development and changing the employees’ mindset [92]. According to Soltero & Waldrip [93], Kaizen training should be first provided to managers/supervisors/leaders of all levels because they not only focus on soliciting proposals but also act as “bellwethers” in the journey for successful Kaizen implementation. Therefore, such training helps them to (1) clearly understand the philosophy; (2) realize positive outcomes of Kaizen implementation for their better reinforcement and engagement; (3) know how to motivate and elicit active participation of their employees; and (4) lead the whole process of continuous improvement.

Moreover, through on-the-job/off-the-job training and proper schemes for job rotation or relocation, organizations gain certain benefits from innovative suggestions/ideas of their employees [94, 95]. Importantly, the training not only equips the employees with new skills and updated knowledge but also raises their awareness of continuous improvement [96] and sense of belonging [97]. In addition, there is a statistically significant relationship between employee training and employee motivation [98, 99] as well as employee engagement [100–103].

With this factor, the following hypotheses will be investigated:

- (i) H3: Training has positive impacts on the successful Kaizen implementation.
- (ii) H4: Training has positive impacts on the sustainable performance.

*2.5.3. Environment.* Realyvásquez et al. [104] also pointed out that environmental elements such as air quality, humidity, temperature, noise, lighting have significant impacts on workers’ psychological characteristics and their performance whereas Day & Randell [97] claimed that a healthy working environment is one of the cores of Kaizen philosophy because it positively results in significant increase in employees’ commitment, retention, stakeholders’ satisfaction, and firms’ financial performance. In addition, working environment strongly affects organizational productivity [105] and employee satisfaction [106–108], leading to an increase in overall performance. Hence, a good working environment in terms of openness, cleanliness, tidiness, social interaction, interpersonal relationship, group norms and values, organizational structure, etc. makes employees self-motivated and concentrated to their work with better behavior, attitude, and productivity [109].

Similarly, Liker & Franz [110] and Soltero & Waldrip [93] pointed out that Kaizen implementation needs a democratic working environment in which open communication, creativity, innovation, and improvement proposals among employees are appreciated and encouraged. Aguado et al. [111] claimed that innovation is the best approach to efficiency and sustainability. As such, Stadnicka & Sakano [112] suggested that organizations should create a friendly working environment and build their culture of continuous improvement for their successful Kaizen implementation.

With this factor, the following hypotheses will be investigated:

- (i) H5: Environment has positive impacts on the successful Kaizen implementation.
- (ii) H6: Environment has positive impacts on the sustainable performance.

*2.5.4. Assessment.* As discussed above, training is mainly aimed at changing people’s behavior. To have an effective training program, Gravells [113] proposed a training cycle with five stages: identifying needs, planning and designing, delivering, assessing, and evaluating. Among them, assessing training needs and effectiveness of training program as well as increase in employee performance/ability/skills/attitudes in their work is a critical task [114–116]. Therefore, employee assessment must be done before the training, in the training, and after the training so that we can have necessary actions to improve the performance of the whole system. Importantly, such assessment provides useful information to evaluate the effectiveness of the training program and to design future ones better.

Nonetheless, in order to ensure the success of Kaizen implementation, regularly assessing the improvement of work ergonomics (employee productivity, efficiency, attitude, etc.) and working environment (vibrations, noise, internal

air pollution, microclimate, radiation, dustiness or energy expenditure of the worker, etc.) is critical [117]. Such regular activity is of great help in taking prompt corrective actions if needed to properly adjust relevant processes and/or approaches to achieve certain specific targets.

With this factor, the following hypotheses will be investigated:

- (i) H7: Assessment has positive impacts on the successful Kaizen implementation.
- (ii) H8: Assessment has positive impacts on the sustainable performance.

**2.5.5. Motivation.** In the field of organizational behavior, there are two key components of job motivation: intrinsic motivation and extrinsic motivation [118, 119], which urge employees to accomplish their personal and organizational goals [120–124]. And there are several motivation approaches, including salary and benefits [125–128], rewards and recognition [129–131], career promotion [132–137], and empowerment [129, 138–141]. Motivation approaches should be carefully considered and selected in line with required improvements [142, 143].

In the current context of fierce competition on the marketplace, motivated and engaged employees are usually considered as invaluable asset and competitive advantage of an organization [144]. And, employee motivation is a key determinant of organizational success [145] because motivated employees tend to foster a creative working environment [146–148] and accept changes for better [146], resulting in increased profitability [149], higher customer satisfaction and loyalty due to better customer service [150, 151], and improved organizational competitiveness [152]. Besides, it is also found that motivated workforce usually (1) think creatively and proactively [153, 154]; (2) have higher job satisfaction [155–157]; (3) perform better [151, 158, 159]; (4) have higher life satisfaction [160, 161]; (5) have higher productivity [150, 162]; and (6) are more diligent and loyal [163–165]. As such, employee motivation is one of the key determinants for the success of Kaizen implementation [63, 86, 166–169].

With this factor, the following hypotheses will be investigated:

- (i) H9: Motivation has positive impacts on the successful Kaizen implementation.
- (ii) H10: Motivation has positive impacts on the sustainable performance.

**2.5.6. Mindset.** This factor is newly proposed in this study through a formal qualitative research as presented in Section 3. In this study, the term “mindset” refers to that of all management levels and employees. Literally, Dweck [170] defined a mindset as the views a person adopts for himself/herself. Such views, including personal assumptions and expectations, significantly affect his/her usual behaviors and relevant responses to his/her daily affairs. Besides, Thomas et al. [171] defined employees’ mindset as their attitudes, behaviors, and practices which shape the way an organization

approaches and executes its strategies. There are two major types of mindset: fixed mindset and growth mindset [170]. The growth mindset is more important because it provides more benefits in terms of creating resilience [172–174], tenacity [172], improving collaboration, communication and engagement [174], and increasing motivation for learning and developing [175]. However, relationships between mindset and successful Kaizen implementation as well as sustainable performance are left unsolved in the current literature. Therefore, investigating its impacts is one of the key contributions presented in this study.

With this factor, the following hypotheses will be investigated:

- (i) H11: Mindset has positive impacts on the successful Kaizen implementation.
- (ii) H12: Mindset has positive impacts on the sustainable performance.

**2.5.7. Engagement.** To ensure the success of Kaizen implementation, several studies have claimed that all management levels and employees should proactively engage in the journey towards operational excellence through continuous improvement. The engagement from management levels closely relates to their supports and commitments. And that from employees should be further examined. According to Takeuchi et al. [176], employees in Toyota are appreciated as a source of knowledge and wisdom of experience; thus, they should engage in the continuous improvement process. Practically, there have been several different definitions of employee engagement in the field of organizational behavior, but generally it is all about how employees stay either emotionally, cognitively, or physically connected with their organizations [177–179]. Anitha [102] claimed that employee engagement is critical for an organization to gain not only useful business performance results but also competitive advantages over its rivals. It is because engaged employees help organizations serve customers better in terms of satisfaction, loyalty, productivity, and profit [180]. Moreover, they tend to be more satisfied with their jobs, committed, and loyal to their organizations [181] because they believe that they constitute a part of the organization [182]. Siddhanta & Roy [183] found that engagement makes employees more motivated and committed; thus, it positively affects organizational performance [182, 184–193]. Hence, engaged employees tend to proactively and enthusiastically participate in assigned activities with their full responsibilities.

To improve employee engagement, Marinova et al. [194] suggested that companies build different incentive systems and continuous improvement programs so that employees become satisfied and motivated with their jobs. Stadnicka & Sakano [112] claimed that active participation of all members, including management and employees, is critical for the success of continuous improvement/Kaizen implementation of an organization.

With this factor, the following hypotheses will be investigated:

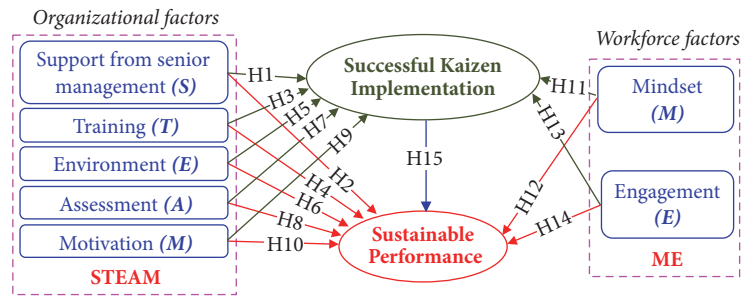


FIGURE 1: Proposed research model.

- (i) H13: Engagement has positive impacts on the successful Kaizen implementation.
- (ii) H14: Engagement has positive impacts on the sustainable performance.

Moreover, with the relationship between Kaizen and sustainable performance of organizations presented in Section 2.4, this study will also investigate the following hypothesis:

- (i) H15: Successful Kaizen implementation has positive impacts on the sustainable performance.

Thus, the research model proposed in this study is visually presented in Figure 1.

### 3. Research Method

This research is conducted in three main phases as explained in the followings.

**3.1. Phase 1: Questionnaire Design.** This initial phase is aimed at constructing a complete questionnaire for a formal survey. From the exhaustive literature review mentioned in Section 2.5, a list of six determinants, namely, support from senior management, training, environment, assessment, motivation, and engagement, is created and then used to conduct a qualitative research to validate the relevance of the factors and explore other prospective ones. The qualitative research invited seven experts from two companies which have successfully implemented Kaizen in Dong Nai and Binh Duong. Among the seven, two are working as director and vice director, three working as managers of their warehouses and production departments, and two working as Kaizen leaders. Their practical experiences from such positions would provide clear insights into these factors as well as suggesting possible measures for the success of Kaizen implementation in their cases.

From the initial interviews, they not only agreed about the relevance of the six listed factors but also proposed a new factor named “mindset of all personnel in an organization” to be considered in this study. The importance of this newly added factor has already been discussed in Section 2.5. Moreover, they also provided some key measures of a successful Kaizen implementation as discussed in Section 2.3.2 above. These inputs were carefully considered in the design of primary

survey questionnaire which was then used in a pilot test to evaluate the lucidity of each surveyed statement in terms of meaning and word usage. Four participants from top management levels of other two companies located in Ho Chi Minh City joined the pilot test. Their feedback was carefully checked and integrated to refine the questionnaire for an official survey. The final version consists of three major parts:

- (1) Seven independent factors are composed of 34 observed items. The participants were asked to evaluate the importance level of each item on a 5-Likert scale towards the success of Kaizen implementation in their organizations, where 1 indicates the least important level and 5 indicates the most important level.
- (2) Successful Kaizen implementation is composed of 6 observed items whose success levels are evaluated on a 5-Likert scale where 1 indicates lowest level and 5 indicates highest level.
- (3) Organizational performance consists of 6 items reflecting the economic performance, environment performance, and social performance. The participants were asked to evaluate the current performance of these items on a 5-Likert scale (1- “unacceptable”, 2- “inconsistent”, 3- “rather effective”, 4- “effective”, 5- “exceptional”).

For brevity, full contents of these constructs and detailed items will be supplemented on request.

**3.2. Phase 2: Survey and Data Capture.** The official survey was conducted from March 15, 2018, to June 20, 2018. First, from personal network with other trainees participating in previous workshops on Kaizen, this study lists 62 SMEs which have successfully implemented Kaizen; among them, 34 SMEs are located in the South, 21 SMEs are in the north, and the rest are in the middle of Vietnam. Then, 254 hard copies of the final questionnaire were directly delivered to 254 people working as directors, vice directors, department managers, or Kaizen leaders in the selected SMEs. Because the objectives of this study were effectively communicated, most of them actively took part in the survey. Therefore, 237 out of 254 pieces of completed questionnaires were collected. Among them, there were 24 pieces invalid, so, data from 213 valid observations were finally analyzed in this study. Prior to

TABLE 2: Codes of investigated constructs and observed items.

<i>Constructs</i>	<i>No. of items</i>	<i>Codes</i>
Supports from senior management ( <i>SUP</i> )	6	SUP1 → SUP6
Training ( <i>TRA</i> )	4	TRA1 → TRA4
Environment ( <i>ENV</i> )	4	ENV1 → ENV4
Assessment ( <i>AST</i> )	5	AST1 → AST5
Motivation ( <i>MOT</i> )	5	MOT1 → MOT5
Mindset ( <i>MIN</i> )	6	MIN1 → MIN6
Engagement ( <i>ENG</i> )	4	ENG1 → ENG4
Successful Kaizen implementation ( <i>SUC</i> )	6	SUC1 → SUC6
Organizational performance ( <i>PER</i> )	6	PER1 → PER6

TABLE 3: Descriptive statistics of respondents.

<i>Demographic Characteristics</i>	<i>Frequency</i>	<i>Percent (%)</i>	
<i>Working Position</i>	Kaizen leader	62	29.1
	Department Manager	107	50.2
	Director/Vice Director	44	20.7
<i>Enterprise Location</i>	South of Vietnam	172	80.8
	Middle of Vietnam	7	3.2
	North of Vietnam	34	16.0
<i>Enterprise Size</i>	Micro	14	6.6
	Small	84	39.4
	Medium	115	54.0
<i>Ownership Type</i>	State-owned enterprise	9	4.2
	Private enterprise	37	17.4
	Joint-venture enterprise	79	37.1
	Foreign-owned enterprise	88	41.3

the analysis, the investigated constructs and their observed items are accordingly coded as shown in Table 2.

**3.3. Phase 3: Data Analysis.** In this phase, the collected data were first screened. Some data analysis approaches like exploratory factor analysis (EFA) and scale reliability analysis with Cronbach's Alpha ( $\alpha$ ) coefficients were deployed with IBM SPSS V.22. Fundamentally, EFA is considered appropriate if its parameters well satisfy the following criteria: (1) eigenvalue  $\geq 1$ ; (2) total variance explained  $\geq 50\%$ ; (3) KMO  $\geq 0.5$ ; (4) significance (Sig.) coefficient of KMO test  $\leq 0.05$ ; (5) factor loadings of all observed variables  $\geq 0.4$  as there are 213 observations in the sample; and (6) weight difference between the loadings of two factors  $> 0.3$  [195]. And, key criteria to judge if a scale is considered reliable include the following: (1) all corrected item-total correlations of its components are  $> 0.3$ ; (2) its  $\alpha$  coefficient  $\geq 0.7$  [196].

After EFA and scale reliability analysis, the extracted factors are further analyzed with (1) confirmatory factor analysis (CFA) to affirm their unidirectionality, internal consistency, convergence value, and distinguishing value; (2) structural equation modelling (SEM) to test the validity of

the proposed research model and stated hypotheses [39, 43]. According to Hair et al. [197] and Steenkamp & Trijpp [198], these two analyses are considered appropriate if the following criteria are satisfied: (1) the significance value (p-value) of the Chi-square test  $\leq 0.05$ ; (2) ratio of Chi-square (CMIN) over the degree of freedom (df),  $CMIN/df \leq 2.00$  (in some cases,  $CMIN/df \leq 3.00$  is also acceptable); (3) the goodness of fit index (GFI), Tucker-Lewis index (TLI), and comparative fit index (CFI)  $\geq 0.90$ ; (4) root mean square error of approximation (RMSEA)  $\leq 0.08$ ; (5) overall reliability  $\geq 0.6$ ; and (6) extracted variance  $\geq 0.5$ .

## 4. Empirical Results

**4.1. Descriptive Statistics.** Some key characteristics of the 213 respondents are briefly shown in Table 3. Particularly, among the 213 valid observations, there were 172 people, accounting for 80.8%, from 34 SMEs located in the South because most of existing joint-venture and foreign-owned enterprises are located in the South due to special calls for investment and attractive policies by the local authorities to create dynamic business environment.



TABLE 4: EFA rotated matrix of independent variables and reliability analysis.

	<i>Component<sup>a</sup></i>							$\alpha$	<i>CITC<sup>b</sup></i>	$\alpha$ if item deleted
	1	2	3	4	5	6	7			
MIN1	0.938								0.905	0.890
MIN3	0.853								0.791	0.805
MIN5	0.844							0.845	0.781	0.807
MIN6	0.828								0.748	0.811
MIN4	0.809								0.726	0.814
MIN2	0.784								0.707	0.816
SUP1		0.916							0.863	0.892
SUP3		0.850							0.791	0.803
SUP5		0.849						0.832	0.785	0.804
SUP2		0.831							0.748	0.809
SUP6		0.811							0.735	0.810
SUP4		0.795							0.708	0.814
AST2			0.899						0.838	0.818
AST1			0.876						0.795	0.827
AST4			0.856					0.851	0.778	0.831
AST3			0.854						0.778	0.831
AST5			0.775						0.686	0.750
ENV1				0.891					0.809	0.785
ENV3				0.858				0.865	0.721	0.823
ENV4				0.806					0.668	0.845
ENV2				0.783					0.655	0.849
MOT1					0.885				0.787	0.735
MOT3					0.831			0.811	0.681	0.784
MOT4					0.765				0.609	0.816
MOT2					0.738				0.590	0.823
ENG3						0.795			0.633	0.718
ENG4						0.784		0.773	0.618	0.726
ENG1						0.763			0.582	0.744
ENG2						0.761			0.554	0.758
TRA1							0.795		0.599	0.694
TRA3							0.791	0.765	0.605	0.691
TRA2							0.755		0.552	0.719
TRA4							0.706		0.514	0.740

Extraction method: Principal Component Analysis.

Rotation method: Varimax with Kaiser Normalization.

(a) Rotation converged in 6 iterations.

(b) Corrected item-total correlation.

Moreover, more than 50% of the participants are working as department managers and about 30% working as Kaizen leaders in the investigated enterprises; generally, about 80% of the respondents are from joint-venture and foreign-owned enterprises. In addition, 54% and about 40% of the participants are from medium size and small size enterprises, respectively.

*4.2. Exploratory Factor Analysis.* The latent relationships among the 34 observed variables of seven key factors are first investigated with EFA approach. Results from the first

analysis showed that MOT5 failed to satisfy the required criterion of discrimination in its loadings among two extracted factors; thus, it was dropped out from the list of variables. The second analysis of 33 items resulted in seven factors extracted as shown in Table 4. With the obtained  $KMO = 0.792$ , the significance of Bartlett's test  $p$ -value  $\leq 0.001$ , and the satisfactory factor loadings of the components, EFA analysis used in this study is considered appropriate.

*4.3. Scale Reliability Analysis.* These extracted scales were then tested for their internal consistency with scale reliability

TABLE 5: EFA rotated matrix of dependent variables and reliability analysis.

	Component <sup>a</sup>		$\alpha$	CITC <sup>b</sup>	$\alpha$ if item deleted
	1	2			
PER1	0.908		0.875	0.853	0.891
PER2	0.874			0.808	0.898
PER6	0.842			0.765	0.904
PER3	0.837			0.758	0.905
PER5	0.826			0.748	0.906
PER4	0.770			0.679	0.916
SUC4		0.884	0.824	0.816	0.860
SUC1		0.862		0.786	0.864
SUC3		0.805		0.708	0.877
SUC6		0.780		0.676	0.882
SUC2		0.761		0.659	0.885
SUC5		0.759		0.657	0.885

Extraction method: Principal Component Analysis.

Rotation method: Varimax with Kaiser Normalization.

(a) Rotation converged in 3 iterations.

(b) Corrected item-total correlation.

TABLE 6: Confirmatory factor analysis.

Term	Scale	No. of Observed variables	Reliability test	
			Cronbach's $\alpha$	Composite $\alpha$
Determinants of successful Kaizen implementation and sustainable performance of SMEs in Vietnam	Support from senior management (SUP)	6	0.832	0.835
	Training (TRA)	4	0.765	0.769
	Environment (ENV)	4	0.864	0.867
	Assessment (AST)	5	0.851	0.858
	Motivation (MOT)	4	0.811	0.840
	Mindset (MIN)	6	0.845	0.859
	Engagement (ENG)	4	0.773	0.789
Successful Kaizen implementation (SUC)		6	0.824	0.866
Sustainable performance (PER)		6	0.875	0.896

analysis. Their results are shown in columns “ $\alpha$ ” and “CITC” of Table 4.

The high values of  $\alpha$  coefficients (ranging from 0.773 to 0.865) and all corrected item-total correlations (CITC) larger than 0.3 indicate that the extracted scales have high internal consistency because they well satisfy the required criteria for scale reliability analysis mentioned in Section 3.3; hence, these extracted scales are considered reliable for further analysis, such as CFA and SEM.

With the same token, EFA approach was also used to explore the structure of the dependent factors “successful Kaizen implementation” and “organizational performance”. Table 5 clearly shows that the use of EFA approach for these two scales is also appropriate because its KMO is 0.887, the significance of Bartlett’s test is  $p$ -value  $\leq 0.001$ , and the factor loadings of the components are all larger than 0.4.

**4.4. Confirmatory Factor Analysis.** Table 6 briefly shows the composite reliability of the investigated factors and the two

dependent scales denoted by SUC and PER. And Figure 2 displays estimated standardized results of saturated model in CFA, including  $CMIN=1253.360$ ,  $df= 909$ ,  $p$ -value  $\leq 0.001$ ,  $CMIN/df = 1.378 < 2.00$ ,  $GFI= 0.914$ ,  $TLI = 0.932$ ,  $CFI = 0.928$ ,  $RMSEA = 0.042 < 0.08$ . As these figures well satisfy the required criteria for CFA in terms of (1) unidimensionality, (2) scale reliability, (3) convergent validity, and (4) discriminant validity presented in Section 3.3, it can be concluded that the research model fits market data.

#### 4.5. Structural Equation Modelling

**4.5.1. Model of Successful Kaizen Implementation.** Figure 3 briefly shows the analysis results of SEM model of the determinants of the successful Kaizen implementation of SMEs in Vietnam. The estimated standardized parameters of the saturated model, such as  $CMIN= 953.090$ ,  $df= 674$ ,  $p$ -value  $\leq 0.001$ ,  $CMIN/df = 1.414 < 2.00$ ,  $GFI=0.916$ ,  $TLI=0.933$ ,  $CFI=0.939$ ,  $RMSEA=0.044 < 0.08$ , well satisfy the required criteria for SEM as presented in Section 3.3; thus, the

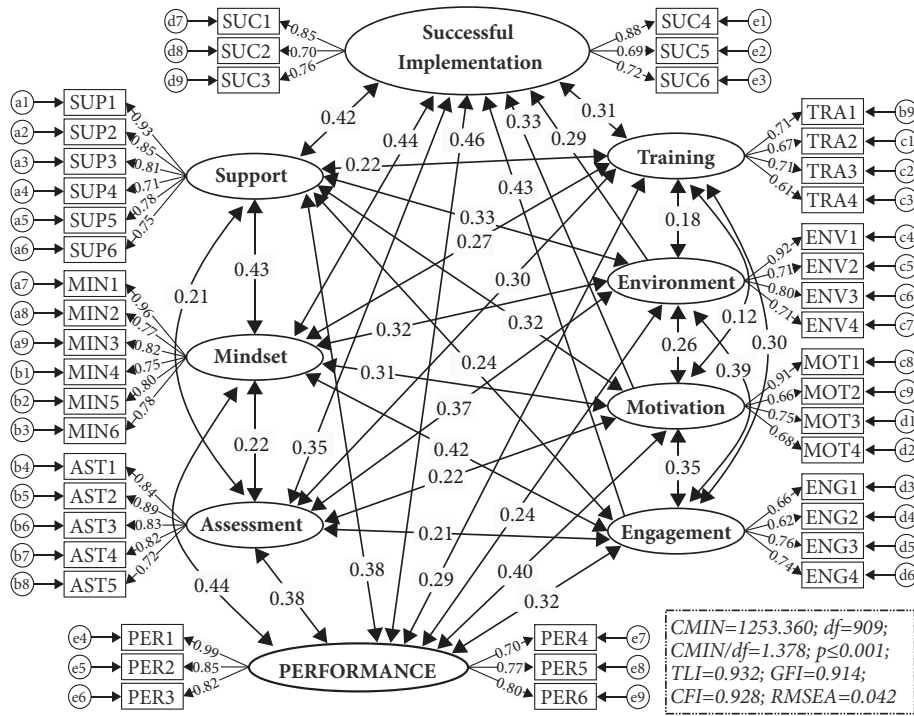


FIGURE 2: Confirmatory factor analysis.

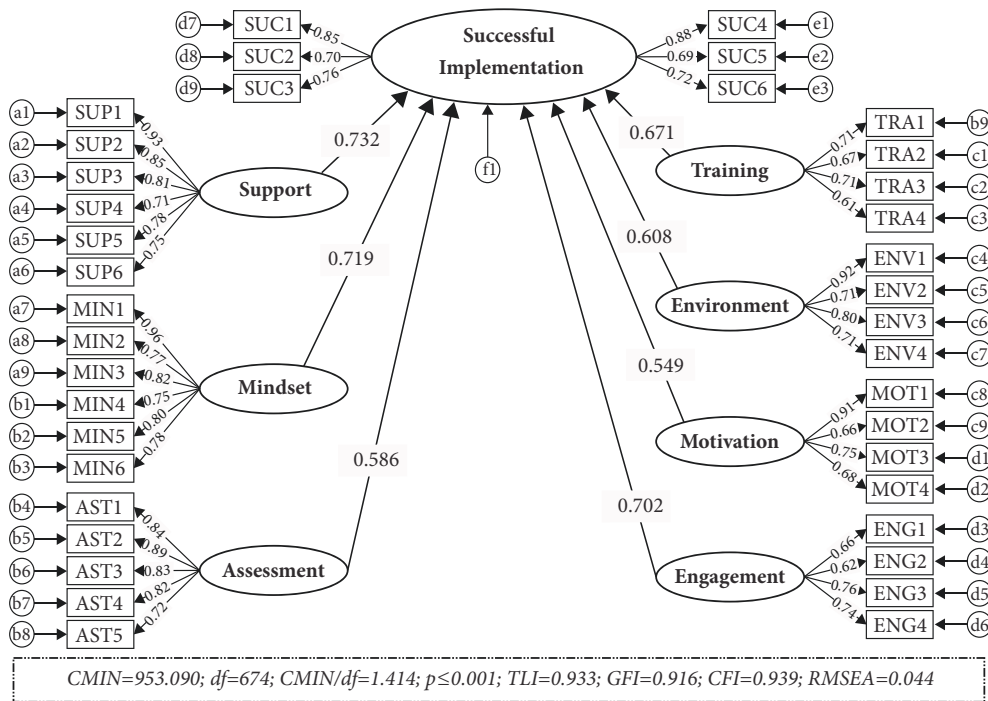


FIGURE 3: Standardized SEM model of successful Kaizen implementation.

proposed model is considered fit for the actual data. In addition, the bias of the model estimation obtained from bootstrapping 500 times was found insignificant. Therefore, it can be concluded that the estimates obtained in the model are reliable.

4.5.2. *Model of Sustainable Performance.* With the same token, Figure 4 displays the analysis results of the determinants of sustainable performance of SMEs in Vietnam. The estimated standardized parameters, such as CMIN= 1253.360, df= 909, p-value  $\leq$  0.001, CMIN/df = 1.378 < 2.00, GFI =

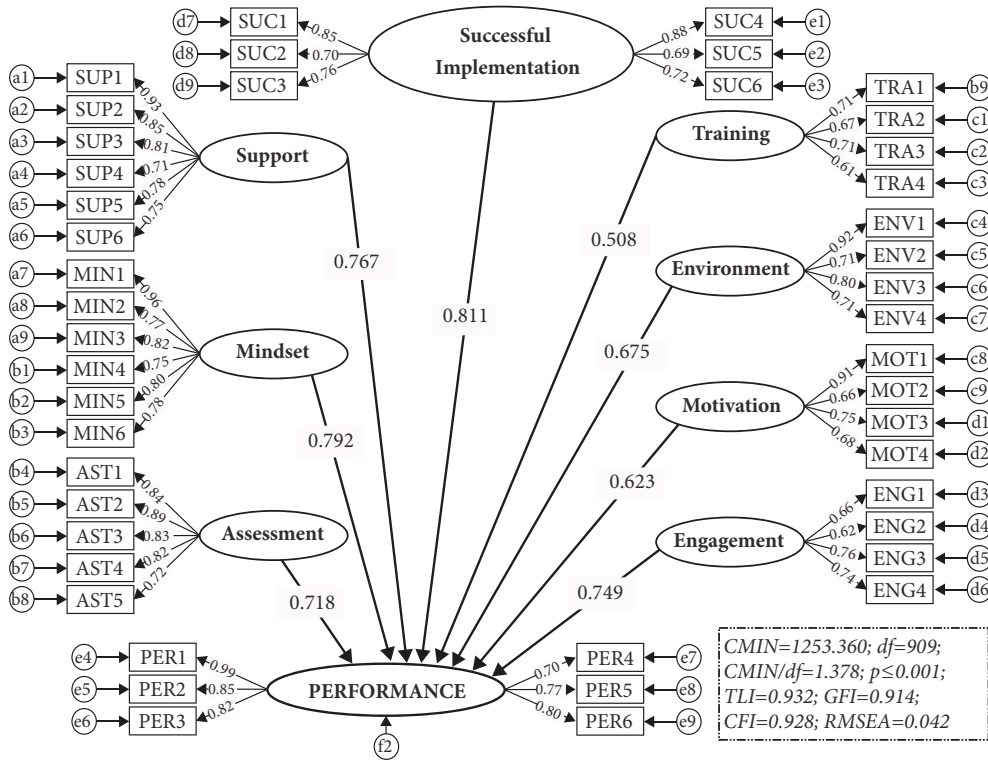


FIGURE 4: Standardized SEM model of sustainable performance of SMEs in Vietnam.

0.914, TLI = 0.932, CFI = 0.928, RMSEA = 0.042 < 0.08, well satisfy the required criteria for SEM as presented in Section 3.3; thus, the proposed model is considered fit for the actual data. Moreover, analysis results obtained from 500-time bootstrapping approach show that there is insignificant bias in the model estimation parameters, indicating that the obtained model estimates are reliable.

4.6. Hypothesis Tests with SEM. The results of the model estimation and bootstrapping in SEM shown in Table 7 clearly indicate that all of the proposed hypotheses (H1 → H15) are statistically supported as the p-values of related coefficients are less than 0.05.

4.7. Tests of the Impacts of Demographic Characteristics. This study used one-way ANOVA test to investigate the impacts of demographic characteristics such as location, size, ownership type of the enterprise, and the working position of the respondents on the evaluation of the two dependent factors, “successful Kaizen implementation” and “organizational performance”. In order to achieve the objective, two new variables coded as “SUCC” and “PERF” were created by taking averages of the six components of each dependent factor, respectively.

Table 8 briefly presents the analysis results from tests of homogeneity of variances among the groups within each characteristic. With the given significance level of 5% used in this study, Table 8 clearly shows the different variances of SUCC and PERF among respondents’ groups based on the

ownership type and the enterprise location. In addition, the variances of PERF among respondents’ groups based on the enterprise size are also different. The results in Table 8 provide important information to further test the equality of means of SUCC and PERF among the groups within each characteristic as shown in Table 9.

The figures in Table 9 clearly show that there are certain differences in the evaluation of SUCC and PERF among groups based on the working position, ownership type, and enterprise size. From the results in Table 8 and Table 9, post hoc tests were conducted to investigate which groups are different from others.

- (1) In terms of working positions, Kaizen leaders and department managers have similar evaluations which are higher than those of directors/vice directors. It was found that Kaizen leaders and department managers are the ones directly involving in the Kaizen implementation and monitoring the improvement from the shop floors; thus, they tend to be satisfied with the success and the organizational performance. However, as directors and vice directors more concerned about the overall performance and general targets, they always expect to have better gains.
- (2) In terms of size, it was found that medium enterprises have better success and higher performance than the micro and small ones because they usually pay more attention to the improvement of their operational effectiveness and efficiency to increase their competitive advantages.

TABLE 7: Coefficients from the SEM model.

<i>Relationships</i>	<i>Coefficients</i>	<i>Std. Coefs.<sup>a</sup></i>	<i>S.E.<sup>b</sup></i>	<i>C.R.<sup>c</sup></i>	<i>p-value</i>	<i>Conclusion</i>
SUC ← SUP	0.729	0.732	0.089	8.191	*	H1 supported
SUC ← MIN	0.712	0.719	0.081	8.790	*	H11 supported
SUC ← ENG	0.716	0.702	0.079	9.063	*	H13 supported
SUC ← TRA	0.693	0.671	0.079	8.772	*	H3 supported
SUC ← ENV	0.591	0.608	0.053	11.151	*	H5 supported
SUC ← AST	0.578	0.586	0.085	6.800	*	H7 supported
SUC ← MOT	0.557	0.549	0.072	7.736	*	H9 supported
PER ← SUC	0.802	0.811	0.067	11.970	*	H15 supported
PER ← MIN	0.785	0.792	0.081	9.691	*	H12 supported
PER ← SUP	0.791	0.767	0.061	12.967	*	H2 supported
PER ← ENG	0.751	0.749	0.079	9.506	*	H14 supported
PER ← AST	0.722	0.718	0.076	9.500	*	H8 supported
PER ← ENV	0.659	0.675	0.053	12.434	*	H6 supported
PER ← MOT	0.642	0.623	0.071	9.042	*	H10 supported
PER ← TRA	0.504	0.508	0.075	6.720	*	H4 supported

Notes: <sup>a</sup> standardized coefficients; <sup>b</sup> standard error; <sup>c</sup> critical ratio; \* less than 0.1%.

TABLE 8: Tests of homogeneity of variances.

<i>Characteristic</i>	<i>Factor</i>	<i>Levene Statistic</i>	<i>df1</i>	<i>df2</i>	<i>Sig.</i>
Ownership type	SUCC	3.4894	2	210	0.032
	PERF	3.1752	2	210	0.044
Enterprise location	SUCC	3.9012	2	210	0.022
	PERF	3.2636	2	210	0.040
Enterprise size	SUCC	1.9781	2	210	0.141
	PERF	1.2796	2	210	0.280
Working position	SUCC	1.1278	2	210	0.326
	PERF	0.6910	2	210	0.502

(3) In terms of ownership types, it was found that there is no difference in the evaluations of SUCC and PERF between the state-owned enterprises and local private ones, and between the joint-venture enterprises and foreign-owned ones. However, the joint-venture and foreign-owned enterprises, especially Japan-based ones, were found more successful than others because they better recognize the importance of Kaizen in their business operations and invest more resources to implement it in practice.

(4) In terms of location, it was found that the location of enterprises fails to have significant impacts on the evaluations of SUCC and PERF. This indicates that once Kaizen is carefully understood and implemented, it would result in similar success and performance.

## 5. Discussions and Managerial Implications

*5.1. Discussions.* As shown in Table 7, all research hypotheses proposed in this study are statistically supported, meaning

that the success of Kaizen implementation and the sustainable performance of SMEs in Vietnam are affected by several factors, including (1) supports from senior management; (2) training; (3) working environment; (4) assessment; (5) motivation; (6) mindset; and (7) engagement of all leaders and employees in the enterprises. Among them, the support from senior management ( $\beta=0.732$ ) plays the most important role in the successful Kaizen implementation. This finding further agrees with those by Goodridge et al. [87], García et al. [81], Al-Najem et al. [88], Imai [47], Suárez-Barraza et al. [74], and Crute et al. [89]. Though the support is ranked as the 3rd important factor directly affecting the sustainable performance, it is also considered crucial because the successful Kaizen implementation has the strongest impact on their sustainable performance ( $\beta=0.811$ ). Consequently, senior management should formulate and effectively articulate their supports in terms of commitments, statements, policies, plans, resources, or even direct involvement, etc. SMEs should consider this as their top prioritized factor because it works as the cornerstone for other factors and activities.

TABLE 9: ANOVA.

<i>Characteristic</i>	<i>Factor</i>		<i>Sum of Squares</i>	<i>df</i>	<i>Mean Square</i>	<i>F</i>	<i>Sig.</i>
Ownership type	SUCC	Between Groups	2.159	2	1.080	3.797	0.024
		Within Groups	59.707	210	0.284		
		Total	61.866	212			
	PERF	Between Groups	2.611	2	1.306	4.217	0.016
		Within Groups	65.007	210	0.310		
		Total	67.618	212			
Enterprise location	SUCC	Between Groups	0.564	2	0.282	0.996	0.371
		Within Groups	59.436	210	0.283		
		Total	60.000	212			
	PERF	Between Groups	0.828	2	0.414	1.344	0.263
		Within Groups	64.751	210	0.308		
		Total	65.579	212			
Enterprise size	SUCC	Between Groups	2.310	2	1.155	4.096	0.018
		Within Groups	59.152	210	0.282		
		Total	61.462	212			
	PERF	Between Groups	2.011	2	1.006	3.244	0.041
		Within Groups	65.095	210	0.310		
		Total	67.106	212			
Working position	SUCC	Between Groups	1.992	2	0.996	3.532	0.031
		Within Groups	59.148	210	0.282		
		Total	61.140	212			
	PERF	Between Groups	2.175	2	1.088	3.601	0.029
		Within Groups	63.428	210	0.302		
		Total	65.603	212			

Moreover, mindset of all leaders and employees is ranked as the second important factor determining the success of Kaizen implementation and the sustainable performance of an enterprise, respectively, taking  $\beta=0.719$  and  $0.792$ . This finding further strengthens that of Thomas et al. [171] who claimed that employees' mindset is critical to organizational achievements and sustainability of their high performance because it greatly affects the productivity, innovation, and persistence of the workforce. Positive mindset should be translated into organizational practices to create a good culture for better performance [171] because the good culture helps to hoard habitual changes and support continuous improvement [48, 90]. Consequently, SMEs should have proper policies to foster and cultivate growth mindset in quality culture and continuous improvement practices; meanwhile fixed mindset should be gradually redirected and changed. However, changing the mindset of a person is always a difficult task in practice. Thus, this study proposes some typical implications to deal with it. It is noteworthy that mindset is a newly proposed factor discovered from the qualitative research; thus, it is considered as one of the key contributions of this study.

Along with the mindset, every member in an enterprise should actively and fully participate in the improvement process. Therefore, the engagement is ranked as the third

significant factor affecting the success of Kaizen implementation ( $\beta=0.811$ ) which is similar to the finding by Stadnicka & Sakano [112]. It is also ranked the fourth in affecting the sustainable performance ( $\beta=0.811$ ), further agreeing with [182, 184–193]. Basically, the engagement from management levels can refer to their supports and commitments, whereas the engagement from employees refers to their participation in relevant activities with their responsibility.

In this study, among the seven independent factors, training is found as the fourth important factor affecting the successful Kaizen implementation in the SMEs in Vietnam. Its importance was also previously identified by [52, 74, 90, 91, 96]. As presented in Section 4.4, the training positively helps to change the mindset ( $r=0.27$ ) and improve employee motivation ( $r=0.12$ ) as well as employee engagement ( $r=0.30$ ). Similar findings were found by Alvarado-Ramirez et al. [92]. However, the training has the lowest impact on the sustainable performance. This is explained by the fact that it has significant impacts on other factors such as mindset, engagement, motivation, and success of Kaizen implementation, while these factors have more direct relationships to the organizational performance. Therefore, in general, training also plays crucial role in improving the sustainable performance of the SMEs.

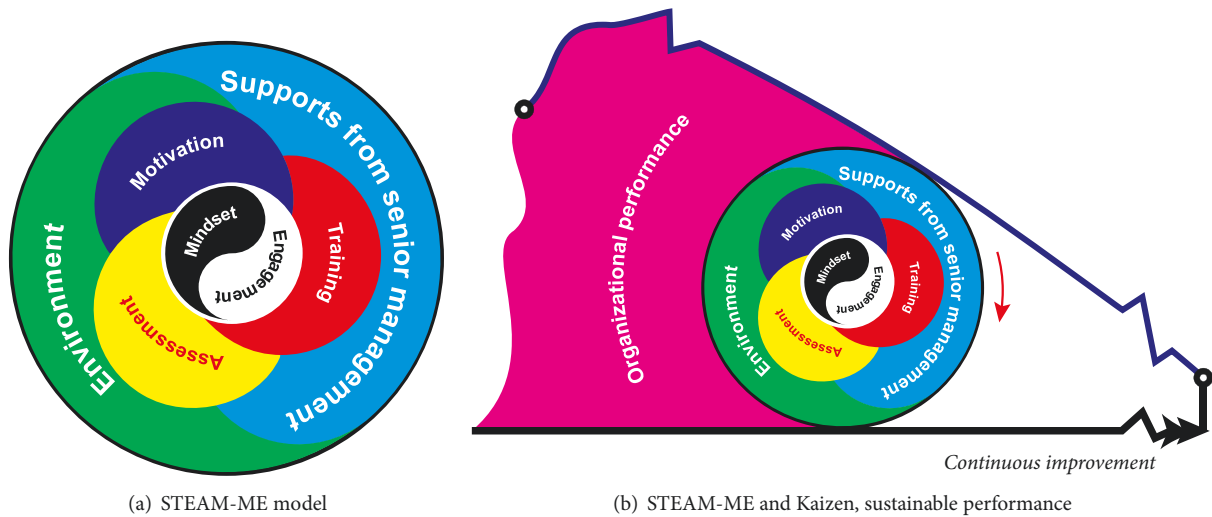


FIGURE 5: STEAM-ME model.

Besides, environment also has positive impacts on the successful Kaizen implementation and the performance of an enterprise. Specifically, its importance is ranked the fifth among the seven factors affecting the success ( $\beta=0.608$ ) and the sixth among the eight factors affecting the performance ( $\beta=0.675$ ). This finding is similar to those by [97, 104–108]. Consequently, creating a friendly working environment and a good culture of quality and continuous improvement is also crucial to be considered by the SMEs in Vietnam.

Practically, this study also finds that regular assessment of work ergonomics (employee productivity, efficiency, attitude, etc.) and working environment (vibrations, noise, internal air pollution, microclimate, radiation, dustiness or energy expenditure of the worker, etc.) has positive impacts on the success of Kaizen implementation and sustainable performance of SMEs because it can help to effectively trace the current progress and lead to reasonable actions to achieve organizational targets. This finding is further validated by Glover et al. [117]. An effective assessment also helps to improve organizational performance.

Lastly, organizations should have good policies and approaches to motivate their employees because the motivation is also a significant factor affecting the successful of Kaizen implementation ( $\beta=0.549$ ) and the organizational performance ( $\beta=0.623$ ). It is further supported by [63, 86, 144, 150, 151, 167–169].

In short, seven determinants of the successful Kaizen implementation and the sustainable performance of SMEs in Vietnam are (1) Supports from senior management; (2) Training; (3) Environment; (4) Assessment; (5) Motivation; (6) Mindset; and (7) Engagement. The first letters of these factors are orderly congregated as “STEAM-ME” which is considered as a novel model for the successful Kaizen implementation and the sustainable performance of SMEs in Vietnam. The name of the model also implies that an organization needs to have a new airflow with energy as “steam” to firstly make gradual changes to start its journey towards significant success in implementing Kaizen and sustaining

organizational performance. The “steam” will make all of its members refreshed and brimful of energy to improve their minds, attitudes, behaviors, engagement, productivity, and responsibilities which will result in substantial increase in both personal and organizational performance.

Especially, Figure 5 visually presents the components of STEAM-ME model and their positive correlations as well as their impacts on the success of Kaizen implementation and organizational performance. Mindset and engagement are placed in the center of the model due to their critical roles as discussed above. Nonetheless, related activities in terms of motivation, training, and assessment taking place help to positively change the mindset and improve the engagement of all members in an organization whereas the supports from senior management and environment provide foundations for the activities.

With the strong correlations identified in Figure 2, no clear boundary exists among these factors as shown in Figure 5(a). They are all flexibly and continuously transformed from one state to others in a spiral endless-circle. Though the model looks like the traditional yin-yang circle, it only presents the mutual relationships and organic transformation among the factors; it does not mean “opposite” as of the yin-yang theory. In addition, the positive impacts of the identified factors on the successful Kaizen implementation and sustainable performance indicate that the more the factors are improved, the more success and the better performance an organization will have. Thus, if the STEAM-ME circle moves forwards, the organization will have better improvement and greater performance. This mechanism is demonstrated in Figure 5(b).

**5.2. Managerial Implications.** The existing literature clearly shows that successfully implementing Kaizen is a long and complex mission which should be integrated into strategic management instead of being considered as a particular project. The insights of the mutual relationships among the seven affecting factors proposed in the novel STEAM-ME

model greatly help business organizations, especially SMEs, to create proper strategies for their continuous improvement and sustainable performance.

Firstly, to effectively cultivate growth mindsets within the organizations, top executives and department managers should be the first ones to refresh their mindsets by taking Kaizen training workshops so that they fully capture the Kaizen philosophy as well as potential benefits they will gain once Kaizen is successfully implemented. This is really important to start the first cycle because such new mindsets not only urge them to set and patiently pursuit Kaizen as a strategic goal but also make them willing to provide sufficient supports and create good environment for their employees. After that, they should either send more staffs to join similar workshops or organize some internal training by either Kaizen experts or the trained executives/managers because the staffs will be the ones directly participating in the continuous improvement process. With encouraging and open environment, they can quickly employ the knowledge and experiences learnt from the training; hence, we can observe immediate improvements. From such training, all members will shape their own Kaizen mindsets which drive them to (1) consider continuous improvement as a permanent need in every daily operation; (2) always welcome suggestions for improvement; (3) always strive for better productivity and quality because there are several areas for improvement; (4) appreciate teamwork and constructive contributions; and (5) always consider “sustainability” in every solutions or activities for long-term achievements. Such Kaizen mindsets will steadily transform into organizational culture of continuous improvement and sustainable development.

Secondly, with the positive mindsets, they will actively engage in improvement processes, and more innovative solutions for improvement will be proposed. Therefore, the SMEs should have right motivation approaches to encourage their engagement and increase their overall performance.

Thirdly, SMEs should have proper tools and measures to incessantly monitor and assess their actual performance and benchmark with their expected outcomes to take corrective actions if needed. Importantly, the tools and measures should incorporate three critical pillars for sustainable performance: people, planet, and profit.

Finally, the findings in Section 4.7 urge the state-owned enterprises and the private ones to pay more attention to the understanding and implementing of Kaizen philosophy in their business operations. They should send more senior leaders/staffs to Kaizen training workshops to fully capture the philosophy and learn the practical experiences from the sharing of their peers. This is really important to improve their competitive advantages against the joint-venture and foreign-owned enterprises to assure their sustainable development in the current trend of regional and international integration. Practically, joint-venture and foreign-owned enterprises tend to implement Kaizen easier because they have better management system with stronger quality culture. Moreover, the micro and small enterprises should also make more efforts to implement Kaizen to improve their performance and their productivity before they can enlarge their business.

## 6. Conclusion

Over the past few decades, Kaizen has been successfully implemented across different industries in many countries worldwide and brought significant benefits towards relevant organizations, including SMEs. SMEs in Vietnam play an important role in developing the national economy. However, the recent trend in international integration urges them to improve their competitive advantages for their survival and sustainable growth. Therefore, this study is aimed at identifying determinants of the successful Kaizen implementation and sustainable performance of SMEs in Vietnam so that others can have proper actions and prioritize their operations in accordance with their available resources. Specifically, through a formal survey of 213 participants from 62 SMEs successfully implementing Kaizen in the North, Middle, and South of Vietnam and appropriate statistical approaches such as exploratory factor analysis (EFA), scale reliability analysis, confirmatory factor analysis (CFA), and structural equation modelling (SEM), seven important determinants have been identified: (1) supports from senior management; (2) training; (3) working environment; (4) assessment; (5) motivation; (6) mindset; and (7) engagement of all members in the enterprises. These seven factors perfectly form a new model named as “*STEAM-ME*”, implying that organizations need to have a new airflow as “steam” to make all of its members refreshed and brimful of energy to foster their growth minds, positive attitudes, behaviors, engagement, productivity, and responsibilities and improve their performance so that the organizations can (1) gain significant success in implementing Kaizen and (2) improve their business performance and competitive advantage for their sustainable development.

In particular, among the seven identified factors, “mindset” is newly proposed in this study. It was identified from the qualitative research and has significant impacts on the success of Kaizen implementation and sustainable performance. The finding obviously adds a new affecting factor to fulfill research gap in the existing literature. In addition, the quantitative relationships among the identified factors help to create an innovative *STEAM-ME* model whose components positively and crucially affect the successful Kaizen implementation and sustainable performance of SMEs in Vietnam.

As this study focuses on SMEs only, future research should investigate if similar determinants exist in the cases of large enterprises and multinational corporations. Comparative analysis of the success and organizational performance among enterprises of all sizes will deepen our understanding of how Kaizen can be successfully implemented across the enterprise sizes.

## Data Availability

The data used to support the findings of this study are available from previously reported studies and datasets, which have been cited. In addition, the official survey and the data will be supplemented by the author upon request.



## Conflicts of Interest

The author declares that there are no conflicts of interest regarding the publication of this paper.

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## Supplementary Materials

Appendix I provides a full list of references supporting the rational validation of the six identified factors presented in the main text while Appendix II provides a table mapping each factor with its reference sources. (*Supplementary Materials*)

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