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RECOGNITION AS AN ENGAGEMENT MECHANISM IN KAIZEN PROGRAMS IN CONSTRUCTION

Melissa A. Freitas[1], Raquel H. Reck[2], Pedro H. A. Bonkowski[3], & Marcus C. T. Fireman[4]

ABSTRACT

This paper examines the implementation of a structured Kaizen program in the construction industry, focusing on the tension between initial employee engagement and the difficulty of sustaining continuous improvement. The study analyzes a three-month pilot project in a paving company, which linked Kaizen to an internal recognition system for implemented improvements. The research, descriptive and exploratory in nature, combined operational participation data with a survey of employees. The questionnaire assessed nine dimensions, including knowledge, motivation, cross-functional collaboration, recognition, and psychological safety. The results indicate high conceptual clarity and engagement: 94.4% of participants strongly agree that the program objectives are clear, and 88.9% report increased motivation. However, 72% identify the maintenance of improvements as the main challenge. The findings reveal a central tension: recognition mechanisms stimulate participation but are not sufficient to institutionalize continuous improvement as a sustainable practice. The study contributes to Lean Construction by positioning recognition as a key engagement mechanism, highlighting the need to combine it with governance structures and standardization.

KEYWORDS

Kaizen, lean construction, recognition, engagement, sustainability.

INTRODUCTION

The term Kaizen, of Japanese origin—derived from Kai (change) and Zen (for the better)—is widely recognized in management literature not as an isolated tool, but as a comprehensive philosophy of continuous improvement, focused on both processes and people development (Imai, 1986; Ortiz, 2009; Singh & Singh, 2009). Although often associated with Lean thinking, the literature establishes a clear distinction: while Lean traditionally focuses on the elimination of operational waste through tools, Kaizen acts as the culture and mindset that promote and sustain continuous improvement (Ortiz, 2009).

At the cultural level, Kaizen represents an organizational mindset in which continuous improvement is embedded in daily routines and sustained through participation at all

[1] Lean Consultant at Climb Consulting Group, Ribeirão Preto, SP, Brazil, +55 31 995183808, melissa@climbgroup.com.br, orcid.org/0009-0004-1824-5054

[2] PhD and Lean Consultant at Climb Consulting Group, Porto Alegre, RS, Brazil, +55 51 998711561, raquel@climbgroup.com.br, orcid.org/0000-0003-1928-3461

[3] Project Manager at Climb Consulting Group, Caçapava, SP, Brazil, +55 12 992474048, pedro@climbgroup.com.br, orcid.org/0009-0005-9836-5482

4 Founding partner of Climb Consulting Group and PhD candidate at NORIE/UFRGS, Porto Alegre, RS, Brazil, +55 51 8216-9070, marcus@climbgroup.com.br, orcid.org/0000-0001-5843-4715

hierarchical levels (Imai, 1997). At the organizational level, it is commonly operationalized as a structured program that integrates routines, standards, leadership practices, and engagement mechanisms aimed at sustaining continuous improvement over time (Bordin et al., 2018). This perspective contrasts with its operational interpretation, in which Kaizen is often reduced to isolated tools or short-term interventions, such as Kaizen events, A3 reports, or 5S practices (Cardoso et al., 2016; Cirino, 2009).

In this study, Kaizen is addressed at the organizational level, focusing on sustaining employee engagement over time. However, in the construction industry, a recurring misalignment is observed between the original philosophy and its practical application on job sites. This instrumental approach often neglects the behavioral and social dimensions required to sustain improvements, a problem already highlighted in the literature, which points to the high risk of programs losing momentum when the focus is placed solely on technical tools (Cardoso et al., 2016; Cirino, 2009). In this context, a central tension emerges between short-term technical success (Monozukuri) and long-term behavioral sustainability (Hitozukuri) (Kon et al., 2025).

This distinction is fundamental, as it allows the analysis to move beyond the effectiveness of isolated tools and focus on the mechanisms that sustain the continuity of improvement practices, particularly organizational recognition (Luthans & Stajkovic, 1999). Defined as positive reinforcers that increase the frequency of desired behaviors, these mechanisms include both formal practices and informal or social recognition. Unlike the traditional emphasis on economic incentives, recognition is understood as a central element for validating efforts, strengthening engagement, and sustaining continuous improvement (Imai, 1997).

Through an exploratory quantitative study grounded in behavioral literature, this research measures subjective variables—such as psychological safety, attitude, and motivation—organized into analytical dimensions derived from the literature. By shifting the analytical focus from technical compliance to cultural recognition mechanisms, the study seeks to demonstrate that the centrality of the human factor is essential for sustaining Kaizen as a management philosophy (Kon et al., 2025).

KAIZEN BEYOND TOOLS: FROM ISOLATED IMPROVEMENT TO ORGANIZATIONAL ENGAGEMENT

The literature clearly distinguishes between the use of isolated tools and the adoption of structured Kaizen programs. The implementation of Lean and Kaizen is often reduced to sporadic interventions, such as events, reports, or formal problem-solving methods (Liker, 2004). This reductionist view—classified by Ortiz (2009) as event-lean—prioritizes technical artifacts over organizational and social dimensions, thereby compromising the sustainability of initiatives over time (Cardoso et al., 2016; Cirino, 2009). Although useful for supporting problem analysis, these tools do not, by themselves, constitute a sustainable management system (Bordin et al., 2018; Liker, 2004).

While tools operate at the diagnostic level, Kaizen, as an organizational strategy, requires a cultural transformation based on routines, leadership practices, and continuous people development (Hitozukuri) (Kon et al., 2025; Ortiz, 2009). The sustainability of this philosophy depends on the intrinsic integration of standardization (SDCA cycle) and continuous improvement (PDCA cycle) (Imai, 1997). For this system to function effectively, active employee engagement is essential and is directly influenced by visible leadership support and structured recognition mechanisms (Bordin et al., 2018; Cardoso et al., 2016; Imai, 1997).

THE HUMAN FACTOR IN CULTURE AND ENGAGEMENT

The sustainability of Kaizen programs is directly linked to organizational culture, requiring a shift in mindset in which employees move from passive executors to active problem solvers

(Kon et al., 2025). Studies indicate that participation in continuous improvement initiatives generates positive impacts on organizational climate, increasing enthusiasm, a sense of belonging, and pride in the work performed (Bessa, 2018; Cardoso et al., 2017).

Furthermore, employees' perceptions constitute a critical success indicator. Evidence shows that the level of understanding of the Kaizen philosophy is positively associated with the perception of its benefits (Bessa, 2018). When workers understand the purpose of change and are empowered to act, Kaizen ceases to be a top-down imposition and instead emerges in a bottom-up manner, a central characteristic of the Japanese management model (Kon et al., 2025).

SUSTAINABILITY AND RECOGNITION IN KAIZEN PROGRAMS

To understand the sustainability of Kaizen programs, it is essential to define organizational recognition mechanisms. The literature rejects the idea that recognition should be exclusively financial, emphasizing that the classical Kaizen approach prioritizes the development of self-disciplined and engaged employees (Imai, 1997). In this context, two main types are distinguished: formal recognition, associated with structured reward programs, and informal or social recognition, based on everyday appreciation practices such as approval, feedback, and visibility of contributions (Luthans & Stajkovic, 1999).

At the Gemba, these informal mechanisms can be organized into three dimensions: (i) visual recognition, through the display of improvements on boards and visible spaces (Ortiz, 2009); (ii) symbolic recognition, such as celebrations and events; and (iii) continuous validation, in which leadership communicates the progress and outcomes of proposed ideas. These practices reinforce employees' sense of value and stimulate active participation (Imai, 1997; Bordin et al., 2018). The consistent application of these mechanisms contributes to the development of psychological safety, understood as the confidence that it is safe to express ideas and point out problems without fear of punishment (Edmondson et al., 2001). This environment is essential for making problems visible and sustaining continuous improvement.

Thus, the integration of organizational recognition and psychological safety materializes the pillar of Hitozukuri (people development), demonstrating that technical success (Monozukuri) depends on the continuous appreciation of the human factor (Kon et al., 2025). Furthermore, reducing the time between improvement actions and their recognition strengthens motivation and prevents the weakening of programs over time (Cardoso et al., 2016).

METHODOLOGY

This study adopts an exploratory case study design with intervention, aiming to investigate how organizational recognition mechanisms influence engagement in Kaizen programs. The research was conducted in a real implementation context, allowing the observation of engagement dynamics in practice.

The research strategy was structured into three complementary stages: (i) program implementation, which establishes the empirical context and introduces recognition mechanisms; (ii) perceptual assessment (survey), which captures metrics related to engagement and psychological safety; and (iii) analysis of operational indicators, used to identify participation patterns over time.

The implementation was carried out by a specialized Lean Construction consultancy in a Brazilian infrastructure and paving company. After identifying low engagement levels during the sustainment phase of the Last Planner System, a Kaizen Program was introduced, focusing on recognizing employees' implemented ideas. To establish a behavioral baseline, participants were not informed of the recognition criteria during the first month. In subsequent months, the system was formally communicated, allowing the observation of its direct influence on participation over a three-month period.

The survey stage targeted employees with relevant roles in sustaining the program. Of the 26 invited participants, 18 valid responses were obtained (response rate of 69%), resulting in a sample (N = 18) composed of managers, coordinators, and administrative teams. This technical profile ensures familiarity with the Gemba and the critical capacity to assess organizational impacts. Data collection was conducted anonymously to avoid response bias.

The data collection instrument was specifically developed for this study, focusing on human and organizational aspects, in contrast to traditional technical compliance audits. The questionnaire was structured into nine analytical dimensions, grounded in prior literature: knowledge (Imai, 1986; Ortiz, 2009), motivation, engagement, and recognition (Luthans & Stajkovic, 1999), collaboration (Bordin et al., 2018; Cardoso et al., 2016), and psychological safety (Edmondson et al., 2001).

As presented in Table 1, variables in Sections 1 to 8 were measured using a five-point Likert scale (1 = strongly disagree; 5 = strongly agree), while Section 9 used the Net Promoter Score (NPS, 0 to 10). This approach allows for quantifying the intensity of perceptions and identifying gaps not captured by traditional productivity indicators (Guerra, 2010). Perceptual data (N = 18) were analyzed using descriptive statistics, including means and agreement percentages (levels 4 and 5).

Table 1: Questionnaire structure

Section	Section title	Objective
1	Knowledge and Understanding of Kaizen	Assesses participants' prior and acquired understanding of the Kaizen concept, clarity regarding the program's objectives, and comprehension of how to apply it in daily work routines.
2	Attitude, Motivation, and Engagement	Measures personal interest in participation, enthusiasm for future activities, and willingness to suggest ideas and have one's opinions considered.
3	Work Impact and Perceived Benefits	Investigates perceptions of tangible improvements in the physical environment and work processes, such as waste reduction, organization, agility, efficiency, and workplace safety.
4	Cross-Functional Collaboration	Focuses on organizational integration by assessing whether the program facilitated communication between departments, joint problem-solving, and understanding of challenges faced by other areas.
5	Competencies and Sustainability	Assesses the development of employees' ability to propose improvements (autonomy and competence) and their critical perception of the maintenance and long-term continuity of implemented improvements.
6	Recognition, Feedback, and Leadership Support	Examines whether the recognition system is motivating, whether leadership supports improvement initiatives, and whether evaluation and reward processes are perceived as fair and transparent.
7	Psychological Safety and Sense of Belonging	Evaluates whether the environment enables employees to feel safe in pointing out problems and whether their ideas are heard by the team without fear of judgment or negative consequences.
8	Overall Satisfaction with the Program	Measures the extent to which expectations were met, satisfaction with achieved results, and perceptions of organization and consistency in program management.
9	Program Recommendation (Net Promoter Score – NPS)	Assesses overall satisfaction and internal legitimacy of the Kaizen Program based on employees' willingness to recommend participation to colleagues or other organizations.

To complement the analysis, operational indicators were examined over the three-month implementation period, such as the number of Kaizens, employees involved, and measured gains. The combination of perceptual and operational data enabled the triangulation of evidence, increasing the analytical robustness of the study.

Finally, the study's limitations should be acknowledged: the small sample size (N = 18), the cross-sectional nature of the data—limiting long-term analysis—and the focus on a single organizational context. Therefore, the results are not intended for statistical generalization, but rather to provide analytical insights into engagement mechanisms in Kaizen programs.

RESULTS AND DISCUSSION

Unlike isolated Kaizen events, the results presented in this study refer to a structured Kaizen Program, associated with an internal system for recognizing and valuing improvement ideas effectively implemented by employees. This framing is central to the interpretation of the results, as organizational recognition acts as a mechanism for engagement, the development of psychological safety, and the stimulation of collaboration among teams.

Additionally, to facilitate data interpretation, the tables presented in the paper use a color scale associated with percentage values. Values equal or close to zero are represented in red, while higher values are represented in green. Intermediate values within this range are represented in yellow.

KNOWLEDGE AND CONCEPTUAL CLARITY

The first barrier to implementing any Lean program is a lack of understanding. Table 2 indicates that this barrier was successfully overcome during the preparation phase. In this context, only 5.6% of the sample (1 out of 18 respondents) reported having prior knowledge of the Kaizen concept before the program's implementation, highlighting the need for initial conceptual clarification.

Following communication and training activities, 94.4% of participants (17 individuals) strongly agreed that the program was clearly explained. Consistently, 94.4% (17 respondents) also strongly agreed that the program objectives are clear.

Furthermore, the results (N = 18) demonstrate comprehensive capability development: 100% of employees (18 individuals) reported knowing how to apply Kaizen in their work area, with 88.9% (16 respondents) strongly agreeing and 11.1% (2 respondents) partially agreeing. Similarly, all participants considered their level of knowledge sufficient to engage in the activities, with 83.3% (15 individuals) strongly agreeing and 16.7% (3 individuals) partially agreeing.

These indicators suggest that the organization was successful in translating the theoretical philosophy into everyday practice, a critical step in preventing Kaizen from being perceived merely as a "bureaucratic tool" and in fostering people development (Hitozukuri).

Table 2: Percentage distribution of responses – Section 1

	1	2	3	4	5
Before the Program, I already had knowledge of what Kaizen is.	33,3	16,7	22,2	22,2	5,6
The Program was clearly explained to employees.	0	0	0	5,6	94,4
The objectives of the Program are clear to me.	0	0	5,6	0	94,4
I know how to apply Kaizen in my work area.	0	0	0	11,1	88,9
My level of knowledge about Kaizen is adequate to participate in the activities.	0	0	0	16,7	83,3

ATTITUDE, MOTIVATION, AND PSYCHOLOGICAL SAFETY

One of the strongest indicators of the program's cultural success is intrinsic motivation (Section 2). Unlike the resistance often observed in top-down change initiatives, 88.9% of respondents reported enjoying participation in continuous improvement activities. More importantly, 94.4% stated that they feel comfortable suggesting ideas and perceive that their opinions are considered.

This environment of psychological safety was further reinforced by the results from Section 7, in which 94.4% of participants indicated that it is safe to point out problems in the workplace. This finding reinforces the concept of Gemba as a space of transparency rather than punishment, which is essential for making problems (waste) visible and enabling their resolution. Additionally, 88.9% of respondents reported that the program increased their motivation at work.

These results indicate that the high level of perceived psychological safety does not stem solely from the adoption of the Kaizen philosophy, but also from the way the program was structured. The combination of participation, implementation of Kaizen initiatives, and explicit recognition contributes to reducing the perceived risk among employees, making the proposal of improvements a socially accepted and valued practice. Table 3 summarizes respondents' perceptions from Sections 2 and 7.

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Table 3: Percentage results of Sections 2 and 7

	1	2	3	4	5
I enjoy participating in continuous improvement activities.	0	0	5,6	5,6	88,9
I feel comfortable suggesting improvement ideas.	0	0	5,6	0	94,4
I feel that my opinion is considered during the improvement process.	0	0	0	5,6	94,4
It is safe to point out problems in my work environment.	0	0	0	5,6	94,4
The program increased my motivation at work.	0	0	5,6	5,6	88,9

TANGIBLE AND INTANGIBLE IMPACTS

Employees (N = 18) perceived clear benefits in both physical operations and organizational climate, as presented in Table 4. (i) Physical impacts (5S and processes): 77.8% of respondents (14 individuals) perceived improvements in workplace organization, and 72.2% (13 individuals) agreed that the changes contributed to reducing rework. (ii) Organizational climate impacts: Kaizen acted as a team integrator, as 77.8% of the sample (14 participants) reported that the program facilitated communication between different areas, and 72.2% (13 respondents) strongly agreed that problems involving more than one area are resolved more quickly after the implementation of the Program. Additionally, 83.3% (15 individuals) believe that healthy competition encouraged the creation of new Kaizens.

The positive perception of healthy competition and cross-functional integration indicates that the recognition of ideas did not act solely as an individual incentive, but also as a mechanism of social learning, promoting constructive comparison and the dissemination of practices among teams.

Table 4: Percentage results of Sections 3 and 4

	1	2	3	4	5
I perceived better workplace organization after the Kaizens.	0	0	0	22,2	77,8
The changes contributed to reducing rework.	0	0	0	27,8	72,2
The Kaizens facilitated communication across different areas.	0	0	0	22,2	77,8
Problems involving more than one area are resolved more quickly today.	0	0	0	27,8	72,2
I believe that healthy competition can encourage the creation of new Kaizens.	0	0	0	5,6	94,4

THE SUSTAINABILITY CHALLENGE

This finding is particularly relevant for the implementation of Kaizen Programs as a culture of continuous improvement. It confirms that, although the execution of events (tools) generates enthusiasm and immediate results, the internal perception of the sample (N = 18) is that sustaining improvements (culture) requires continuous effort. One employee reinforced this point qualitatively by stating: “The biggest challenge is to create and maintain projects in a definitive way, turning them into a process.”

The coexistence of high levels of engagement—where 100% of participants feel capable of proposing improvements today, with 83.3% (15 respondents) reporting complete ease—with a perceived fragility in maintaining these practices suggests a relevant tension. Half of the sample (50%, or 9 individuals) strongly agrees that maintaining improvements is the greatest challenge of the process, while another 22.2% (4 individuals) partially agree. Although recognition proves effective in stimulating participation and initial learning, the data indicate that it functions as a catalyst for engagement, but is not sufficient, on its own, to ensure the consolidation of improvements as permanent organizational practices. Table 5 summarizes respondents’ perceptions from Section 5.

Table 5: Percentage results of Section 5

	1	2	3	4	5
I am now able to propose improvements more easily.	0	0	0	16,7	83,3
I believe that maintaining improvements is the greatest challenge of the process.	0	5,6	22,2	22,2	50

LEADERSHIP AND RECOGNITION

The results indicate that the Program was supported by active leadership and explicit recognition practices, as presented in Table 6. It is observed that 88.9% of the sample (16 employees) feel that leadership supports and values the implementation of Kaizens, and the same proportion (16 respondents) report that their efforts are recognized by the company. In addition, the recognition system proved to be a driver of engagement, with 77.8% (14 individuals) stating that it actively encourages their participation.

Regarding expectations about the Program (N = 18), 83.3% of participants (15 employees) reported that their expectations were fully met, and 88.9% (16 individuals) evaluated the Kaizen Program as important for the company's daily activities. As for program management, the evaluation was unanimous: 100% of respondents (18 individuals) strongly agreed that the Program is conducted in a consistent and organized manner.

Table 6: Percentage results of Sections 6 and 8

	1	2	3	4	5
Leadership supports and values the implementation of Kaizens.	0	0	5,6	5,6	88,9
I feel that my effort is recognized by the company.	0	0	0	11,1	88,9
The recognition system encourages my participation in Kaizens.	0	0	5,6	16,7	77,8
The program met my expectations.	0	0	0	16,7	83,3
I consider the Kaizen Program important for the company's day-to-day activities.	0	0	0	11,1	88,9
The program is conducted in a consistent and well-organized manner.	0	0	0	0	100

The results indicate that organizational recognition practices play a fundamental role in the observed engagement, functioning as a mechanism that fosters psychological safety and motivation for participation in the Kaizen Program. By making employees' contributions visible and valued, the program creates favorable conditions for active involvement, cross-functional collaboration, and the development of continuous improvement-related competencies.

The analysis of operational data over the three-month period reinforces the survey findings regarding the role of recognition. As shown in Figure 1, during the first month of implementation—when employees were not yet aware of the reward criteria—15 Kaizens were recorded, involving 26 employees, of which 6 presented measurable gains.

After the introduction and communication of the recognition system, a significant increase in participation was observed. In the second month, 34 Kaizens were recorded, with the participation of 36 employees and 9 Kaizens with measurable gains. In the third month, even with a slight reduction in the number of employees involved (29), the number of recorded Kaizens remained high (39), with 9 presenting measurable gains.

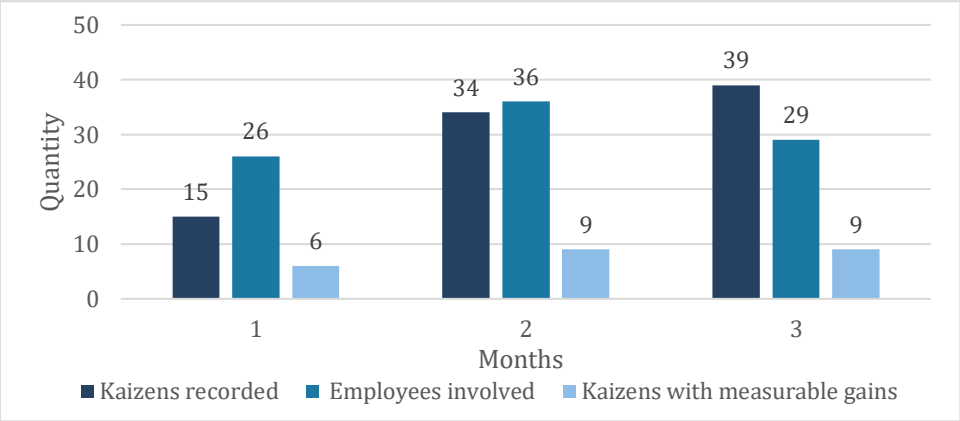

Figure 1. Evolution of employee participation in the Kaizen Program over a three-month period

These results suggest that recognition practices acted as a relevant stimulus for both participation and the continuity of improvement initiatives. This reinforces the interpretation that the observed engagement is not limited to the mere application of Kaizen tools, but is intrinsically associated with how the program was structured and communicated to employees.

GLOBAL SATISFACTION (NPS)

As a synthetic indicator, the Net Promoter Score (NPS) reached its maximum value, with 100% of the sample (18 respondents) recommending participation in the Kaizen Program to a colleague. This result suggests that the program achieved strong internal acceptance, reinforcing the perception that continuous effort is actively valued and recognized, rather than being interpreted as merely an increase in workload.

The findings confirm that the sustainability of Kaizen goes beyond the technical effectiveness of isolated events, requiring the centrality of the human factor (Hitozukuri). Examining the underlying mechanisms, long-term engagement is driven by informal recognition practices at the Gemba. Unlike purely extrinsic rewards, these continuous validation practices foster psychological safety and intrinsic motivation, transforming episodic improvement into a behavioral routine.

As a practical implication, managers should shift from an exclusive focus on formal rewards to acting as facilitators of daily feedback. Finally, since the need for recognition is rooted in universal human psychological traits, the effectiveness of these mechanisms in sustaining improvement programs can be considered broadly generalizable to other labor-intensive industries.

CONCLUSION

In summary, this study demonstrated that the effectiveness and sustainability of Kaizen programs in the construction industry go beyond the mere application of isolated technical tools. For Kaizen to endure as a management philosophy, the centrality of the human factor (Hitozukuri) must be positioned as the foundation of the production system.

As evidenced by the results, organizational recognition mechanisms operate as the drivers of engagement. Informal recognition and continuous validation on the shop floor (Gemba) create an environment of psychological safety that reduces resistance to change and strengthens intrinsic motivation. Additionally, this environment of appreciation serves as a crucial strategy for employee retention, a particularly relevant impact given the current shortage of skilled labor in the construction sector.

However, the study highlights important limitations. Despite high initial engagement, sustaining improvements remains the main challenge of the program, and the three-month evaluation period limits the analysis of the long-term sustainability of these practices.

Therefore, as a direction for future research, longitudinal multi-case studies are recommended to investigate the evolution and sustainability of improvements across different stages of system maturity. It is also suggested to explore the impact of structured Kaizen programs in organizations with an established Total Quality Management (TQM) culture, analyzing how this prior cultural foundation influences the replicability of results across different contexts.

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