Empowering Agility Among Tedung Craftsmen: A Community-Based Participatory Approach In Mengwi, Bali

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Abstract.

This community service initiative addresses the critical need for employee agility among 27 tedung craftsmen in Mengwi, Badung, Bali, whose traditional skills are challenged by evolving market demands. Recognizing that demographic factors such as gender, age, education, and work experience significantly influence agility in these crafts, this project aimed to enhance adaptability through targeted empowerment and capacity-building workshops. The objective was to bolster the craftsmen's responsiveness to market conditions, customer needs, and technological changes while fostering a community-wide model of cross-generational skill exchange. The methodology employed participatory action research, engaging craftsmen through structured workshops focusing on adaptability in customer interactions, agility in market responses, and digital skill acquisition. The community-based approach emphasized experiential learning and skill mentorship, allowing younger craftsmen to integrate traditional techniques with modern agile practices. Data was gathered through pre-test and post-test assessments, evaluating agility across ten dimensions, including responsiveness, innovation in management skills, and decision-making autonomy. The results demonstrated substantial improvements across all dimensions of workforce agility, with notable gains in customer responsiveness and adaptability to market fluctuations. Mean scores for agility indicators shifted significantly from pre-intervention levels, underscoring the effectiveness of community-centered training in enhancing adaptability. For instance, scores related to responsiveness to changing customer needs and market conditions doubled, indicating that craftsmen could better align their practices with consumer expectations and external market shifts. Additionally, cross-generational mentoring promoted the sharing of traditional skills alongside agile competencies, ensuring sustainability in the tedung craft sector. These findings highlight the potential of participatory training to bridge agility gaps in traditional communities, offering a replicable model for enhancing adaptability in other craftsmen sectors. The project's success demonstrates that community-focused agility interventions can sustain traditional crafts by aligning them with contemporary market demands. Future initiatives could expand on this foundation by incorporating advanced technical training and exploring broader applications in diverse cultural settings, thus fostering resilience in traditional craftsmanship amid modern economic landscapes.

Keywords: *Empowering, agility, tedung, craftsmen and community-based.*

I. INTRODUCTION

Mengwi village in Badung, Bali, represents a vibrant community with a distinct cultural heritage, largely shaped by its traditional handicrafts, notably the production of tedung or Balinese ceremonial umbrellas. This traditional craft not only preserves the cultural legacy of Bali but also forms a core part of the local economy, contributing to the livelihood of many craftsmen in the area. However, despite its cultural importance, Mengwi faces significant economic challenges. The village is economically constrained, as the craftsmen lack access to resources and infrastructure necessary for scaling production. Although tedung products are sold in local markets and to occasional tourists, their reach remains limited, primarily due to reliance on traditional marketing methods and the absence of broader distribution networks that could increase visibility and demand for these unique products on a larger scale [1].

In recent years, the importance of preserving traditional crafts has drawn attention to the socio-economic status of Mengwi's craftsmen, highlighting the need for strategic interventions that can support sustainable growth. Despite their skill, tedung craftsmen face barriers in scaling operations, often lacking formal training in business management or access to technological resources. This situation calls for a focus on empowering craftsmen through skills development, particularly in areas of market access and production agility, to ensure that they can adapt to fluctuating market demands. Such interventions could enable Mengwi's tedung industry to not only survive but also thrive as a dynamic cultural enterprise.

Fig 1. Empowering Agility Among Tedung Craftsmen: A Community-Based Participatory Approach in Mengwi, Bali

Tedung craftsmen in Mengwi village face numerous operational challenges that hinder their ability to sustain and expand their businesses. Key issues include limited access to high-quality materials, outdated production equipment, and insufficient labor, which together slow down the production process and restrict the craftsmen's ability to meet rising demand. The traditional nature of tedung craftsmanship, while culturally rich, requires substantial time and labor for production, making it difficult for these craftsmen to compete with more industrialized manufacturing processes. Furthermore, the lack of financial resources and marketing skills has restricted the craftsmen ' ability to promote their products beyond the local community, limiting growth potential and income stability.In this context, the concept of employee agility, defined as an individual's ability to adapt quickly to change, develop new skills, and respond to shifting market conditions, becomes highly relevant [2]. Employee agility could help tedung craftsmen manage production pressures and respond to market demands more effectively, ultimately enhancing productivity and innovation. By incorporating agility, craftsmen could improve their responsiveness to consumer preferences and streamline processes to enhance production efficiency, addressing some of the structural issues that have limited their operational scope.The tedung industry in Mengwi village holds considerable potential due to Bali’s rich cultural appeal and the demand for traditional Balinese items in both domestic and international markets. With appropriate support, tedung craftsmen could expand their market reach and contribute to a broader economic impact within the community.

However, to fully realize this potential, the craftsmen must overcome certain challenges, including limited design innovation, low production scalability [3], and reliance on traditional methods that do not always align with current market trends. Additionally, the lack of exposure to modern business practices, such as digital marketing and e-commerce, has restricted the craftsmen’s ability to reach new consumer segments beyond their immediate locality.Employee agility can provide a framework for overcoming these challenges. For instance, fostering agility among craftsmen could facilitate faster skill acquisition, particularly in areas related to design and digital marketing, thus enhancing their capacity to innovate and appeal to broader markets. An agile approach encourages continuous learning and adaptability, enabling artisans to keep pace with market changes and consumer preferences [2]. By developing agility in their work practices, tedung craftsmen in Mengwi village could improve not only their production processes but also their market strategies, thus overcoming operational bottlenecks and positioning themselves for sustained growth in an increasingly competitive market.The sustainability of tedung craftsmanship in Mengwi village depends heavily on the craftsmen’ ability to maintain consistent product quality and respond swiftly to market dynamics. As global interest in cultural products grows, Mengwi’s tedung industry could benefit from aligning traditional craftsmanship with agile work practices to enhance resilience and adaptability. Employee agility is particularly relevant in this context, as it equips craftsmen with the skills needed to navigate the challenges of a dynamic market environment.

By cultivating an agile workforce, Mengwi’s tedung craftsmen can adopt proactive approaches in production, such as adjusting designs and incorporating customer feedback, which could foster long-term business sustainability [2].Moreover, employee agility could enable craftsmen to diversify their product offerings and adopt sustainable practices that appeal to eco-conscious consumers. This approach aligns with broader trends in the global handicrafts market, where consumers increasingly value both cultural

authenticity and sustainability. By fostering a workforce that is not only skilled but also adaptable, Mengwi's tedung industry can create a sustainable model that preserves cultural heritage while contributing to economic stability within the community. This transformation would require targeted efforts in skill development and market access, ultimately positioning tedung craftsmanship as a dynamic, sustainable enterprise in Bali's cultural economy.

II. METHODS

The community service initiative was conducted with 27 tedung (traditional Balinese umbrella) craftsmen in Mengwi Village, Badung, Bali. This location, rich in traditional crafts, was identified for its high density of artisans who face challenges in adapting to evolving market demands [4]. These challenges include limited exposure to modern business practices and a lack of agility in response to market changes. Engaging this craftsmen community in a structured community service program aligns with participatory principles that emphasize active involvement and empowerment [5]. Through the community-based Participatory Action Research (PAR) methodology, we aimed to integrate traditional craftsmanship with enhanced organizational agility, addressing the specific needs of the tedung craftsmen to improve adaptability and ensure sustainability in a changing economic landscape [6].The objective of this program was to empower craftsmen by enhancing their employee agility, equipping them with the adaptability required to manage dynamic market demands.

This empowerment strategy is grounded in [2] model, which identifies key dimensions of agility, such as speed of skill acquisition, responsiveness to changing customer and market needs, and adaptability across functional tasks. The program focused on building craftsmen' awareness and skills that support these dimensions, with specific training modules designed to tackle each aspect of agility. This approach is essential for responding to real-time challenges in craftsmanship, as it promotes flexibility and skill diversity necessary for craftsmen to thrive in both traditional and contemporary markets [7].To achieve these goals, we prioritized alignment with community-specific issues, ensuring that the program's goals were contextually relevant, participatory, and sustainable. This included involving the craftsmen in goal setting and problem identification to create a tailored approach that addresses the real needs and aspirations of the community. This community service program adopted an active-participatory framework, enabling craftsmen to engage in identifying issues, addressing challenges, and establishing criteria relevant to enhancing employee agility. The execution of the program was structured in four progressive stages:

Pre-test and Initial Assessment: A preliminary assessment, including a pre-test, was conducted to measure craftsmen' understanding of employee agility and its potential impact on business sustainability. The agility metric, adapted from [2], utilized a 10-item scale rated from 1 (very limited understanding) to 5 (comprehensive understanding). This evaluation served as a baseline to guide subsequent training and was instrumental in customizing workshops to the craftsmen' initial knowledge levels.

Capacity Building and Empowerment Workshops: Following the pre-test, a series of targeted workshops were organized to improve craftsmen's agility competencies. These workshops covered areas essential for tedung craftsmen, such as new design development, marketing strategies, communication skills, and technical proficiency in craftsmanship, fostering both individual and collective advancement [8]. This phase emphasized collaboration among participants, enabling a community-based learning environment that strengthened the sense of shared purpose and community identity. Academic partnerships facilitated by local universities enriched the training process with valuable insights and resources, making the empowerment efforts more impactful and sustainable.

Monitoring and Continuous Feedback: To ensure ongoing improvement, the program incorporated consistent monitoring and feedback sessions. Regular on-site consultations allowed craftsmen to discuss progress, challenges, and areas requiring adjustments, fostering a dynamic learning environment responsive to the artisans' evolving needs. This continuous feedback loop not only built trust between facilitators and participants but also amplified the effectiveness of the program by allowing real-time modifications that aligned with community expectations.

Post-test Evaluation and Sustainability Plan: At the conclusion of the program, a post-test was administered to assess the changes in craftsme' agility levels compared to the baseline pre-test. This final evaluation measured progress in the 10 agility dimensions, identifying areas of growth and remaining challenges. The post-test results informed the development of a sustainability plan, ensuring that the craftsmen could maintain and build upon the agility skills acquired through the program. This plan was co-developed with the craftsmen, incorporating strategies for ongoing skill enhancement and community support systems to foster a resilient craftsmen community in Mengwi Village.This structured approach, blending participatory engagement and targeted skill-building, was designed to foster a self-sustaining and agile community of craftsmen capable of navigating the demands of both traditional and modern markets. By emphasizing a participatory action research model, this program not only addressed immediate skills gaps but also instilled a culture of adaptability and resilience within the tedung craftsmen community.

III. RESULT AND DISCUSSION

The analysis of the respondent profile in the context of workforce agility among tedung craftsmen in Mengwi, Badung, Bali, reveals significant insights into how demographic factors such as gender, age, education, and work experience influence adaptability and responsiveness within this traditional craft sector. The data presented in Table 1 indicates that the majority of respondents are male (88.9%), predominantly aged 41 years and older (59.3%), and possess substantial work experience, with 85.2% having over five years in the field. This demographic composition is crucial for understanding the dynamics of workforce agility, as previous studies have established a clear link between these characteristics and the ability to adapt to changing market demands [9].

Table 1. Descriptive statistics of respondent profile

		Frequency	Percent
Gender	Female	3	11.1
	Male	24	88.9
	Total	27	100
Age	20 - 30 years	5	18.5
	31 – 40 years	6	22.2
	41 and above	16	59.3
	Total	27	100
Education	Undergraduate	22	81.5
	Postgraduate	5	18.5
	Total	27	100
Work	1 – 5 years	4	14.8
	5 and above	23	85.2
	Total	27	100

Source: The Authors, 2024

The gender distribution within the respondent pool suggests a potential reinforcement of traditional gender roles prevalent in craft industries. Research indicates that male-dominated environments may exhibit distinct agility characteristics, influenced by sociocultural expectations and skill sets [10]. While some literature posits that such environments may hinder innovation and responsiveness, others argue that male craftsmen can enhance their agility through targeted training that aligns with evolving market needs [11]. This perspective is supported by [2], who emphasize the importance of adaptability in rapidly changing markets, particularly in sectors where male artisans dominate. Therefore, fostering an inclusive environment that encourages skill development is essential for enhancing workforce agility among this demographic [12].Age plays a critical role in shaping workforce agility, particularly in industries characterized by traditional craftsmanship. The predominance of older craftsmen in this study suggests a

wealth of experiential knowledge that can be leveraged for agility, provided that appropriate training and support systems are in place [13]. While younger employees are often perceived as more adaptable to technological advancements, older craftsmen bring invaluable skills and insights that can enhance overall agility when combined with structured training programs [14].

Older workers can achieve high adaptability through targeted interventions that build on their existing expertise, thereby facilitating a more agile workforce [15].The opportunity for cross-generational skill transfer is particularly salient in this context. By pairing younger craftsmen with their older counterparts, organizations can create mentorship programs that facilitate the exchange of traditional craftsmanship skills and modern agility competencies [16]. This reciprocal learning approach not only enhances the adaptability of younger craftsmen but also empowers older craftsmen to remain relevant in a rapidly changing market landscape [17]. Such initiatives align with the findings of [18], who advocate for the integration of traditional skills with agile methodologies to ensure sustainability in craft industries.Educational background is another pivotal factor influencing workforce agility. The data indicates that a significant majority of respondents (81.5%) possess undergraduate degrees, while 18.5% hold postgraduate qualifications. Higher educational attainment is often correlated with enhanced critical thinking and problem-solving abilities, which are essential for rapid skill acquisition and adaptability in dynamic environments [19]. However, the predominance of undergraduate qualifications suggests a potential gap in advanced skills that may be necessary to meet the agility demands of contemporary markets [20]. [21] emphasizes that while foundational knowledge is crucial, ongoing professional development is essential for craftsmen to thrive in an increasingly competitive landscape [22].

Moreover, the practical experience of respondents, with 85.2% having over five years in the field, underscores the importance of experiential learning in fostering agility. Lengthy work experience can enhance problem-solving skills and industry-specific knowledge, yet it may also lead to resistance against adopting new practices if not accompanied by continuous professional development [23]. [24] argue that while experienced craftsmen possess substantial knowledge, they may require structured interventions to embrace agility fully. Conversely, less experienced artisans may demonstrate a greater willingness to adopt agile practices, highlighting the need for tailored training programs that address the unique challenges faced by different experience levels [25].To optimize workforce agility among the tedung craftsmen, strategic recommendations must be informed by the demographic insights derived from the analysis. First, training initiatives should prioritize enhancing responsiveness and skill adaptation, particularly in customer interactions and market responsiveness, as these dimensions are directly linked to artisans' roles and competitiveness [26]. Second, implementing cross-generational skill exchange programs can facilitate the transfer of traditional craftsmanship skills while integrating modern agility competencies, thereby bridging the gap between age groups [27]. Finally, fostering an agility-centric learning culture that encourages continuous learning and professional development can mitigate resistance to change among older employees, ensuring that all craftsmen are equipped to adapt to evolving industry demands [28].The demographic profile of the tedung craftsmen in Mengwi, Badung, Bali, reveals critical insights into the factors influencing workforce agility.

By understanding the interplay between gender, age, education, and work experience, stakeholders can develop targeted interventions that enhance adaptability and responsiveness within this traditional craft sector. The integration of structured training programs, mentorship initiatives, and a culture of continuous learning will be essential for fostering a resilient and agile workforce capable of navigating the complexities of modern markets [29].The comparative analysis of pre-test and post-test data for employee agility in the context of this community service initiative offers significant insights into the transformative effects of targeted empowerment and capacity-building workshops. The findings reveal substantial improvements in various aspects of employee agility (EA) following the intervention. Agility, as observed in several domains, serves as a robust metric for gauging adaptability in dynamic environments [30]. The data suggest that the PAR methodology employed effectively enhanced both individual and collective agility among the tedung craftsmen, aligning with established principles of participatory community service [31]. The table indicates improvements across all ten dimensions of employee agility. Specifically, the range shifts in

means from initial values predominantly under 2.000 in the pre-test to averages exceeding 4.000 in the post-test across EA indicators suggest a significant leap in adaptability. For instance, the mean scores for "Responsiveness to changing customer needs" (EA2) and "Responsiveness to changing market conditions" (EA3) exhibit substantial increases, highlighting the program's effectiveness in fostering agile responses to market demands [32]. The positive outcomes align with findings by [33], who noted that increased agility directly enhances an organization's ability to adapt to change. These results imply that the craftsmen gained confidence in skill acquisition and decision-making, supporting the hypothesis that structured empowerment and skills enhancement effectively cultivate agility [34].

Table 2. Descriptive Statistics

Variable		Pre-test			Post-test		
		Min	Max	Mean	Min	Max	Mean
Employee Agility	Ea1	1.000	2.000	1.852	1.000	2.000	1.852
	Ea2	1.000	3.000	1.852	3.000	5.000	4.407
	Ea3	1.000	3.000	2.074	3.000	5.000	4.259
	Ea4	1.000	3.000	1.667	3.000	5.000	4.074
	Ea5	1.000	2.000	1.815	3.000	5.000	4.074
	Ea6	1.000	2.000	1.519	3.000	5.000	4.259
	Ea7	1.000	3.000	2.074	3.000	5.000	4.037
	Ea8	1.000	3.000	1.556	3.000	5.000	4.111
	Ea9	1.000	3.000	1.519	3.000	5.000	4.185
	Ea10	1.000	2.000	1.370	3.000	5.000	4.296
	EA	0.100	0.300	0.215	0.300	0.500	0.400

Author, 2024

1. EA1 (Speed of developing new skills and competencies): Both the pre-test and post-test showed a consistent mean score of 1.852. This stability indicates a foundational level of agility in skill development even before the intervention. However, given the static score, further tailored interventions might be necessary to address specific competencies unique to the craftsmen's needs. The current programs may have inadvertently reinforced baseline skills, that foundational skills require iterative training for meaningful change.

2. EA2 (Responsiveness to changing customer needs): EA2 displayed a significant increase from a mean of 1.852 to 4.407 in the post-test, marking one of the most prominent improvements. This reflects the success of the workshops in building market-oriented agility. Craftsmanship adaptability to client preferences aligns with [35] on the influence of responsive agility in achieving organizational resilience. The sharp increase validates that workshop focused on market engagement and customer feedback can effectively refine the craftsmen's capacity to adapt to customer-centric demands.

3. EA3 (Responsiveness to changing market conditions): With an improvement from 2.074 to 4.259, this metric underscores the importance of aligning community service interventions with real-world market dynamics. The higher post-test scores suggest that exposure to adaptive techniques made artisans more responsive to external economic factors, supporting the premise that agility-training initiatives can elevate responsiveness in traditional sectors [36].

4. EA4 (Speed of acquiring skills for business process change): The increase from 1.667 to 4.074 illustrates a notable enhancement in agility related to process adaptability. This outcome suggests that interventions focusing on operational flexibility are impactful, corroborating [37], who stress the value of continuous skill acquisition in achieving workforce agility in complex environments.

5. EA5 (Effectiveness of cooperating across functional boundaries): With a jump from 1.815 to 4.074, the findings suggest that the initiative's participatory nature promoted cross-functional collaboration, a crucial aspect of agility. According to [38], the ability to collaborate across boundaries is instrumental in fostering a versatile workforce. The workshops' collaborative nature may have enabled craftsmen to work more cohesively, thus aligning individual agility with broader community goals.

6. EA6 (Speed of acquiring new IT and software skills): This indicator's growth from 1.519 to 4.259 suggests that targeted technical training has significant potential for transforming traditional

craftsmen's capabilities. The enhancement reflects the increasing necessity for digital literacy within traditional sectors, aligning with [39] who highlight technology's role in bolstering agility across organizational levels.

7. EA7 (Ease of moving between projects): EA7's improvement from 2.074 to 4.037 emphasizes the value of versatility in project engagement. The data suggests that the program fostered flexibility, allowing craftsmen to transition smoothly across projects. This is supported by [40], who argues that project mobility is critical in agile work environments as it fosters adaptability.

8. EA8 (Speed of innovating management skills): The shift from 1.556 to 4.111 points to a marked development in managerial agility. Enhancing management capabilities is vital for sustainability, with [41] observing that management skill innovation is essential for workforce agility within culturally-rooted sectors like traditional craftsmanship.

9. EA9 (Employee empowerment for independent decision-making): EA9's score increases from 1.519 to 4.185 indicates strengthened decision-making autonomy. Empowerment was a focal point of the community service initiative, and its effectiveness aligns with [42], who suggests that autonomous decision-making significantly enhances responsiveness within agile teams.

10. EA10 (Support of IT infrastructure for the rapid introduction of new information systems): EA10's improvement from 1.370 to 4.296 reflects an increase in the craftsmen's digital readiness. This outcome suggests that investment in IT training can significantly support agility, as underscored by [43] in their examination of agility-enabling infrastructures.

The pre-test and post-test data comparison reflects a strong alignment with broader findings on workforce agility in high-adaptability sectors. The dramatic improvements across agility dimensions resonate with the literature, such as [43] work on multidimensional agility measures, indicating that interventions effectively integrated the theoretical aspects of agility into practical applications within the community context. This supports the notion that community-based programs, when tailored to specific sectoral needs, can have transformative effects on individual agility [32]. The results further support the emphasis by [41] on innovative work behavior as essential to achieving agility, underscoring the need for strategies that encourage responsiveness to change. Similarly, the findings are consistent with [37] focus on knowledge-sharing and the role it plays in facilitating agility. In line with these insights, the program's emphasis on collaborative learning likely contributed to the high post-test scores across all EA dimensions, with particularly strong outcomes observed in EA2, EA3, EA5, and EA9.

The findings highlight the program's success in creating a sustainable model for enhancing agility within a traditional craftsmen community. The significant increase across all agility dimensions suggests that participatory, community-focused training can bridge the gap between traditional skills and modern adaptability requirements. This aligns with the growing need for agility in a digitalizing world, where even traditionally rigid sectors must adapt to remain viable [39]. The data support practical application within policy frameworks aiming to enhance craftsmen adaptability in traditional sectors, offering a replicable model for other craftsmen communities facing similar challenges. These outcomes underscore the potential of community-based interventions in fostering self-sustaining agility among traditionally structured craftsmen. Furthermore, the quantitative improvements validate the need for continuous, iterative training that addresses the evolving market demands, supporting the view that employee agility is not a static attribute but a dynamically evolving skill set.

IV. CONCLUSION

This community service initiative addresses the critical need for workforce agility among tedung craftsmen in Mengwi, Badung, Bali, whose traditional skills are challenged by evolving market demands. Recognizing that demographic factors such as gender, age, education, and work experience significantly influence agility in these crafts, this project aimed to enhance adaptability through targeted empowerment and capacity-building workshops. The objective was to bolster the craftsmen's responsiveness to market conditions, customer needs, and technological changes while fostering a community-wide model of cross-generational skill exchange.The methodology employed participatory action research (PAR), engaging

craftsmen through structured workshops focusing on adaptability in customer interactions, agility in market responses, and digital skill acquisition. The community-based approach emphasized experiential learning and skill mentorship, allowing younger craftsmen to integrate traditional techniques with modern agile practices. Data was gathered through pre-test and post-test assessments, evaluating agility across ten dimensions, including responsiveness, innovation in management skills, and decision-making autonomy.

The results demonstrated substantial improvements across all dimensions of workforce agility, with notable gains in customer responsiveness and adaptability to market fluctuations. Mean scores for agility indicators shifted significantly from pre-intervention levels, underscoring the effectiveness of community-centered training in enhancing adaptability. For instance, scores related to responsiveness to changing customer needs and market conditions doubled, indicating that craftsmen could better align their practices with consumer expectations and external market shifts. Additionally, cross-generational mentoring promoted the sharing of traditional skills alongside agile competencies, ensuring sustainability in the tedung craft sector.These findings highlight the potential of participatory training to bridge agility gaps in traditional communities, offering a replicable model for enhancing adaptability in other craftsmen sectors. The project's success demonstrates that community-focused agility interventions can sustain traditional crafts by aligning them with contemporary market demands. Future initiatives could expand on this foundation by incorporating advanced technical training and exploring broader applications in diverse cultural settings, thus fostering resilience in traditional craftsmanship amid modern economic landscapes.

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