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Article

Unlocking Innovation and Sustainability in Communities of Practice: Exploring Duality in SME Clusters

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Abstract: The significance of industrial clusters in the development of small and medium enterprises (SMEs) in remote areas has long been acknowledged. However, there is a lack of research examining innovation and sustainability within these clusters through the lens of Communities of Practice (CoPs). Thus, this study was carried out to specifically investigate the concept of Duality in SME clusters in remote regions of Taiwan to comprehend how Duality contributes to innovation and sustainability in these clusters. To gather data, a combination of purposive and snowball sampling methods was used. We visited a total of 12 SME clusters and interviewed the cluster leader and a senior member within each cluster, resulting in 24 respondents in total. The findings indicated that innovation within SME industrial clusters in remote areas of Taiwan is spurred by the concept of Duality, which is deeply rooted in shared practices and collaborative tasks. These collaborative tasks and shared practices facilitate continuous cycles of mutual engagement, joint enterprise, and shared repertoire, ultimately nurturing creativity. It was confirmed that the concept of Duality allows for clarifying how SME clusters establish their learning mechanisms, not only enhancing creativity but also reinforcing sustainability.

Keywords: Duality, Communities of practice, CoPs, Industrial cluster, Sustainability, Organizational learning

1. Introduction

The concept of inter-organizational learning has garnered significant attention in organizational studies (Li et al., 2022), particularly concerning its impact on the sustainable development of small and medium-sized enterprise (SME) clusters (Tell, 2000). Members within industrial clusters collaborate, share practices, and interact for the exchange of information, sharing of best practices, and dissemination of knowledge, thereby enhancing the cluster's individual and collective learning capabilities (Wodnik, Andiappan, Di Ruggiero, & Lavery, 2022). These operations align with the characteristics described by Wenger (1998). Firstly, members learn from each other to enhance their digital marketing capabilities and engage in integrated marketing, demonstrating mutual engagement for more productive learning and development (Gerolamo, Carpinetti, Vitoreli, Sordan & Lima, 2014). Secondly, members share a common mission and collaborate for mutual benefit, reflecting the characteristics of a joint venture. Thirdly, members invest time to know each other and gradually build trust and a willingness to share personal resources. Over time, shared dynamics such as networks, interaction patterns (Amin & Cohendet, 2005), stories, symbols, and rituals are established within the community, forming a shared repertoire (Gau, 2016). Given that industry clusters exhibit the characteristics of communities of practice (CoPs), it is suitable to discuss their operational methods and the formation of their resilience through the lens of CoPs.

CoPs have long been recognized for their knowledge management function, serving as crucial mechanisms that bridge individual and organizational learning. Many studies even consider these communities as knowledge hubs. In the medical industry, CoPs enhance the knowledge, skills, and attitudes of doctors, nurses, and patients (Horberg, Lindstrom, Scheja, Conte, & Kalen, 2019). In education, they improve teaching, promote local-school collaboration, and find applications in professional subjects to enhance students' expertise (McGrath, Liljedahl, & Palmgren, 2020), leading to the formation of professional education networks (Anderson, Ross, Macrae & Wiig, 2020). In elderly education, various types of CoPs, such as interest groups, self-directed learning groups, and senior citizen learning centers enhance the quality of life for seniors (Gau, 2011; Gau, 2013; Gau, 2016). McNaughton (2020) explored art education during the COVID-19 pandemic, where online art gallery CoPs fostered emotional exchange and mutual support through art sharing and fusion. In business, CoPs have become think tanks, solving business problems and facilitating talent development, especially in innovation and knowledge management (Choi, Ahn, Jung & Kim, 2020). In the economy, governments form industry clusters through CoPs to enhance technology and capabilities for rural industries (Hu & Zhang, 2022).

CoPs thrive in various industries because they gather knowledgeable individuals and enhance members' expertise. These interconnected communities facilitate knowledge flow, sharing, and improvement through their networks.

Within SME clusters, which often comprise geographically dispersed firms facing unique challenges and resource constraints, understanding the dynamics of inter-organizational learning becomes even more critical. The importance of geographical proximity, previously considered crucial for clusters, has undergone a gradual shift. Numerous alliances and partnerships, often termed strategies, have become the essence of industrial clusters (Peteraf & Shanley, 1997; Gomes-Casseres, 1994). During these interactions, binary situations and dualities such as the juxtaposition of tradition and innovation, competition, and cooperation often emerge. These dual situations resemble double-edged swords, serving as both driving forces propelling the industrial cluster forward and potential sources of disruption capable of overturning the entire cluster (Wodnik et al., 2022).

The understanding that dynamic networks and interactive relations are the pivotal features of modern industrial clusters has been steadily evolving (Amin & Cohendet, 2005). Previous research (Jones & Macpherson, 2006) illuminated the positive influence of collaboration, innovation, and collective interests on the sustainable growth of SME clusters. However, it is essential to recognize that these positive outcomes are not solely driven by a singular dimension (Gerolamo, Carpinetti, Vitoreli, Sordan & Lima, 2014), but rather by the delicate balance between interconnected binary oppositions. These oppositions encompass the duality of collaboration and competition, innovation and tradition, as well as individual interests and collective interests.

Wenger's (1998) concept of duality in CoPs underscored the significance of the domain and the community for the vitality and effectiveness of the community. The domain furnishes content and focus, while the community aspect facilitates the social interactions necessary for learning and collaboration. Important concepts such as participation and reification, designed and emergent, identification and negotiability, local and global, have been identified to illuminate the intricate dynamics and multifaceted nature of various phenomena within CoPs. The concept of duality also mirrors specific situations within SME clusters, explaining how inter-organizational learning promotes sustainability. However, a research gap exists concerning how the interplay between these elements influences sustainability outcomes in SME clusters. Additionally, scant attention has been given to the challenges of balancing these elements for long-term sustainability. Narrowing this gap is crucial for comprehending how inter-organizational learning can foster sustainable development in SME clusters.

The purpose of this study was to explore the interconnected duality within the inter-organizational learning process and investigate how a balanced integration of these opposing elements positively impacts the long-term sustainability of SME clusters. Through the Digital Cluster Counseling Program for Small and Medium-sized Enterprises (DCCP for SMEs) in Taiwan, this study also aimed to understand how duality operates within inter-organizational Communities of Practice (CoPs) such as industrial clusters. The DCCP for SMEs is a project initiated by the Small and Medium Enterprise Administration of the Ministry of Economic Affairs. Its main objective is to improve the operations of small and medium enterprises in rural areas by assembling qualified consultants and community leaders to form communities. These CoPs utilize formal and informal learning activities to integrate local resources to enhance the digital capabilities of the enterprises and strengthen their operational skills. The clusters in this program refer to groups of eight or more SMEs with distinctive characteristics in internet marketing or storytelling. With the guidance of consultants and digital learning resources provided by the program, the enterprises within the clusters receive assistance in integrating various perspectives to enhance their competitiveness (Taiwan Information Software Association, 2018).

By recognizing and examining the intricate interplay between collaboration and competition, innovation and tradition, as well as individual interests and collective interests, the mechanisms through which SME clusters achieve sustainable growth were elucidated. Given the complexity of these dualities, the dynamics within industrial clusters were delved into. Specifically, it was uncovered how these clusters adeptly navigate dualities to bolster their efforts toward sustainable development. Through this exploration, a deeper comprehension of how duality was harnessed for growth and resilience within industrial clusters. Ultimately, the findings of this study contribute to academic knowledge and practical insights for policymakers and practitioners to promote the sustainable development of SME clusters in an increasingly dynamic and competitive business environment.

2. Materials and Methods

Qualitative interviews were conducted to investigate factors influencing interactions among members within industrial clusters, with a focus on 12 clusters in central and southern Taiwan engaged in the DCCP for SMEs program. Purposive and snowball sampling methods were employed to ensure a comprehensive understanding. In purposive sampling, clusters were selected based on specific criteria: active participation in the DCCP for SMEs program, a strong operational reputation, regular learning activities, and eagerness to share their experiences. Additionally, the snowball sampling method was performed by interviewing 2 cluster leaders recommended by consultants. Interviewees were then asked to suggest 1 or 2 more clusters that met the study's criteria, continuing the snowball sampling process.

To gain insights into individual learning interactions within the clusters, two representatives from each of the 12 selected clusters were interviewed, namely the cluster leader and a senior member, totaling 24 interviewees. The semi-structured interview method based on Wenger's community of practice characteristics was used with mutual engagement, joint enterprise, and shared repertoire. The interview outline consisted of two main sections: (1) Respondent's Personal Information, covering community characteristics, time invested, and roles within the community, and (2) Primary Research Questions. The sections encompassed community operational modes, key challenges, resolutions, factors supporting mutual engagement, promoting joint enterprise, and fostering shared repertoire. Before interviews, interviewees were briefed on the research's purpose and informed about the recording process. They had the option to decline questions or stop recording if they felt uncomfortable. Data confidentiality was assured, and informed consent forms were collected and retained for five years. During interviews, each participant consented to a 90−120 minute session and recording. Afterward, the recordings verbatim were transcribed and shared them with participants for review. Data analysis followed, with clarification of research questions and organization of raw data based on relevant theories. Identification codes were assigned using interviewee characteristics: gender (Mr. or Ms.), location (O, P, Q, W, Y, representing different remote areas), interviewee cluster sequence (1, 2, 3), and interviewee role (L for leaders; S for senior members). For instance, “Mr. Q1L” denotes a male interviewee from the Q region, belonging to the first interviewee cluster, in a leadership role.

3. Findings

3.1. Mutual Engagement: Balancing Contradictions and Leveraging Competition for Development

In the process of mutual engagement within industrial clusters, competition and cooperation are interrelated yet contradictory. Positive competition and cooperation enhance the competitiveness and creativity of industrial clusters, providing members with broader development opportunities.

3.1.1. Contradictions Trigger Tensions but also Facilitate Cooperation

In industrial clusters, tension often arises between competition and cooperation. Competition can spark hostility and disagreements among members, as individuals vie for excellence. On the other hand, cooperation demands that individuals set aside personal interests in favor of the collective benefit of the entire cluster. P1L mentioned, "*We've created an environment where members can compete with each other to do their best.*" Y1L added, “*For the team to succeed, they need to work together and also strive for excellence individually*.” This competitive dynamic among cluster members may lead to conflicts over resources and conflicting interests. Conversely, cooperation hinges on mutual trust and collective effort. While these contradictions can give rise to tensions and conflicts, they also offer opportunities for coordination and the delicate balance between competition and cooperation, ultimately fostering cooperative relationships.

Competition and cooperation bring about each other to offer broader opportunities for development Contradictions trigger tensions but also facilitate cooperation. Healthy competition within a cluster drives innovation and ongoing improvement, as it inspires members to consistently pursue excellence. Simultaneously, cooperation among cluster members allows for the sharing of risks and responsibilities in the pursuit of shared objectives. Y2S's experience showed how teamwork helped: “*By working together on this marketing project, I learned more about selling tea from my teammates. So, now I can sell their tea in my store*.”

3.2. Joint Enterprise: Catalyzing Creativity Through Tradition-Innovation Dialogues and Integration

In forming a joint enterprise within industrial clusters, tradition and innovation appear to be contradictory but mutually reinforcing, contributing to the continuity and development of the community.

3.2.1. Clashes and Debates Derived from the Dialogues between Tradition and Innovation Foster Creativity and Transformation

When crafting a shared vision, the interplay of tradition and innovation often leads to tensions and conflicts. Previous members may express doubts regarding ideas put forth by innovators, apprehensive about compromising traditional core values and identity. Innovators, in turn, might perceive traditional practices as restrictive and outdated. This clash between tradition and innovation sparks intellectual clashes and debates, ultimately enhancing creativity and catalyzing transformative processes. W1L pointed out, “*Some people don't like these ideas and worry that we might forget our old customs."* And Ms. P1L mentioned, "*A few creative folks think that old ways aren't useful anymore.*”

3.2.2. Integration and Complementarity Facilitate Continuous Development and Innovation

Tradition serves as a stable foundation and a source of wisdom for innovation, carrying the cluster's history and values. In turn, innovation infuses tradition with fresh vitality and impetus, introducing new perspectives and avenues for development. As Q1L said, "*Even though it's a modern era, lots of our long-time customers still love our old-school style, so we stick to tradition.*" And Q2S chimes in, "*We've also started doing live shows to sell our stuff, and that's bringing in a whole new group of customers."*

3.3. Balancing Individualism and Collectivism: Facilitating Knowledge Sharing and Innovation through Shared Repertoire

In forming shared repertoire within industrial clusters, the two characteristics of individual knowledge and collective knowledge contradict each other, yet they also mutually bring about one another.

3.3.1. Contradiction between Individualism and Collectivism leads to Collaboration Barriers and Knowledge Barriers within the Cluster

Individual knowledge highlights individuals' expertise and uniqueness, often leading to a sense of independence and reluctance to share knowledge among members. Conversely, collective knowledge necessitates members to contribute their expertise for the greater good of the community, requiring them to set aside personal interests. This inherent contradiction can impede collaboration and create knowledge barriers within the group. According to O1L, *"Some folks who believe in doing things on their own might think twice about joining because it costs a lot and you also need to invest your time here."* On the other hand, Mr. Q3L says, *"The important thing is to see how we can all win together and help the community succeed for everyone's sake."*

3.3.2. Mutual Promotion and Complementarity between Individuals and the Collective Enable Knowledge Sharing and Innovation.

Despite the contrast between individual and collective knowledge, they mutually reinforce each other. The diversity and expertise within individual knowledge contribute valuable resources and varied viewpoints to collective knowledge. Simultaneously, the integrative and collaborative nature of collective knowledge elevates the recognition and application of individual knowledge. This synergy between individual and collective knowledge facilitates knowledge sharing and innovation within the cluster. W2L pointed out, *"We come from different types of businesses, and when we put our strengths together, it makes our group stronger with lots of useful stuff."* P3S chimes in, *"When we all work together on projects, we find lots of chances to learn. It's not just about learning more; it also makes us work better."*

4. Discussion

The clustering in industry clusters focuses on a specific knowledge domain, where members enhance their digital capabilities and employ collaborative marketing strategies, and provides a clear rationale for their aggregation. Within these industry clusters, members engage in various interactions, adjust themselves collectively, and foster innovation together (Feldman, Francis, & Bercovits, 2005). Through mutual engagement, they gradually develop a sense of belonging and identity, aligning with the concept of a community. Members also share their practical experiences and apply what they've learned in real-world scenarios, regularly exchanging insights and learning from each other, aligning with the concept of practice.

4.1. Positive Competition and Cooperation, Driven by Mutual Engagement, Fuel Members' Pursuit of Excellence and Innovation

Positive competition, fueled by mutual engagement within an industrial cluster, serves as a potent driver for members to strive for excellence. This aligns with Gau's (2011) assertion that comparisons stimulate creativity and aspirations among Community of Practice (CoP) members, igniting a desire for personal growth and higher status within the community. In essence, whether originating internally or externally, positive competition acts as a catalyst for progress and innovation within the community, continually motivating members to push their boundaries. In contrast, cooperation nurtures trust and a collective spirit among members, establishing enduring collaborative relationships. This unity empowers the community to confront challenges and solve problems together, as noted by Wenger (1998). Cooperation not only unlocks common goals but also provides a psychological sanctuary where cluster members can collectively address adversity and navigate risks. Driven by this trust, members willingly share resources, knowledge, and experiences, extending mutual support and assistance in their shared pursuit of excellence. When members of an industrial cluster engage in cooperative tasks, they gain opportunities for self-discovery and mutual understanding. These interactions highlight differences among members, igniting a motivation to excel and avoid falling behind. Consequently, comparisons foster positive competition for excellence, enhancing the outcomes of cooperative endeavors.

4.2. Combining Tradition and Innovation Fuels Sustainable Growth and Transformation within Clusters.

In a community, traditions and routines embody essential values and experiences, providing a sense of stability and purpose. Similarly, in a group, traditions signify shared agreements, ideas, goals, and unity that maintain the group's core objectives. These traditions and routines form a solid foundation for forging a shared vision. Conversely, innovation involves the exploration of new ideas, approaches, and technologies. This enables groups to adapt to changes and overcome challenges by introducing fresh perspectives and intelligent solutions to enhance their competitiveness and adaptability (Gau, 2013). In industrial clusters, innovation often builds upon established traditions. Leaders and consultants within CoPs utilize the existing framework to stimulate creativity and generate marketing ideas that support their collective marketing practices. They encourage members to think outside the box and explore novel strategies for growth and improvement. This fusion of tradition and innovation fuels sustainable growth and transformation within clusters.

4.3. Individual Learning within an Industrial Cluster Transforms into Organizational Learning, Fostering Collaboration and Synergy

Each company possesses its unique knowledge, skills, and experiences. When these companies form an industrial cluster, they pool their uniqueness to create synergy. This is why CoP can generate a wealth of diverse and intelligent ideas (Gau, 2016). In essence, individual learning serves as the bedrock for organizational learning. Within the industrial cluster context, SMEs collaborate to enhance their e-marketing skills and actively engage in shared practices to disseminate individual knowledge, thereby strengthening organizational knowledge. This aligns with Wenger's (1998) notion that community members collaborate and share their knowledge to construct a shared repertoire, enabling them to collectively solve problems and achieve common goals. The process of shaping a shared repertoire transforms individual learning into organizational learning, enabling the CoP to harness each member's strengths to enhance the cluster's performance. Regarding attitude change, when firms initially join a group, their primary focus is on self-benefit, concentrating on fulfilling their own needs. However, as time passes and a sense of community develops, members start to perceive themselves as part of a unified endeavor and increasingly consider what benefits everyone. This shift in mindset leads them to care more about the cluster's overall success rather than just their gains, signifying the cluster's growing cohesion and improved collaborative performance.

5. Conclusions

In this study, it was explored how duality derived from inter-organizational learning impacts the sustainability of SME clusters. Duality, triggered by collaboration and competition, innovation and tradition, and individual and collective interests, plays a critical role in facilitating the sustainability of SME CoPs. Cooperation and competition are nurtured through mutual engagement, fostering responsibility and a sense of belonging. This motivates individuals to strive for excellence and avoid falling behind their peers. The interplay of innovation and tradition derived from the process of shaping joint enterprise encourages learning and reflection, allowing for the reevaluation of traditional concepts and the development of new ideas based on tradition. The duality of individual and collective interests facilitates the shift from individual to organizational learning by promoting trust and a sense of belonging to shape shared repertoire. By harnessing the full potential of duality, SME clusters can bolster their adaptability, competitiveness, and resilience, ensuring long-term sustainability in a rapidly evolving business landscape. Future research is required to delve deeper into the specific mechanisms through qualitative methods and explore how duality influences sustainability outcomes within SME clusters. The present study result addresses potential challenges and obstacles that may arise in the pursuit of balancing contrasting elements for sustainability. To generalize the results, further research is necessary with quantitative methods to validate the impact and predictability provided by this study.

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