

Transformative Impact of University-Led Communities of Practice on Working Professionals in Japan: A Text Mining Analysis of Self-Reported Changes

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Abstract

This study examined transformations experienced by working professionals in a university-led Community of Practice (CoP), triggering factors, and the university's facilitation role. Participants were 109 working professionals who responded to an end-of-program survey conducted between 2019 and 2024 as part of a leadership development program operated by a national university in Tochigi Prefecture, Japan. Each cohort ran two months with weekly hybrid sessions involving cross-sector professionals learning from regional role models. Text mining analysis using KH Coder examined participants' responses to "What changes have you experienced before and after the program?" through frequency analysis and co-occurrence network analysis. Six clusters emerged representing transformation across five dimensions: cognitive (expanded perspectives and worldviews), behavioral (reflection to action), social (cross-industry networks), professional (workplace application), and personal (increased confidence). Five triggering factors were identified: social learning through diverse interaction, cross-industry exposure, role models, community support, and local contextual relevance. The university's role manifested as neutral convener, knowledge broker, learning designer, and local anchor. Findings demonstrate universities' unique capacity to facilitate cross-sector professional development while serving as regional development hubs.

Keywords: communities of practice, university-led professional development, KH Coder, transformative learning

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Introduction

The rapid advancement of technology, particularly artificial intelligence and digital transformation, has fundamentally reshaped the professional landscape, creating an urgent need for working professionals to continuously update their knowledge and skills. In Japan, employee education has traditionally been the responsibility of employers through comprehensive in-house training systems. However, as the modern workplace increasingly demands career autonomy and lifelong learning, attention has turned to the potential role of universities in providing professional development opportunities for working adults. Universities, positioned as neutral educational institutions with convening power across industries, offer unique opportunities to facilitate professional learning communities that transcend organizational and sectoral boundaries.

Communities of Practice (CoP) offer a theoretical framework that illuminates how universities can effectively facilitate such professional learning and development through structured social interaction. Wenger et al. (2002) define CoPs as “groups of people who share a concern, a set of problems, or a passion about a topic, and who deepen their knowledge and expertise in this area by interacting on an ongoing basis” (p. 4). The framework consists of three essential elements: Domain, a shared area of competence that differentiates members; Community, the social structure that facilitates learning through interaction; and Practice, the shared repertoire of resources, experiences, and ways of addressing problems that members develop together (Wenger, 1998; Wenger et al., 2002).

Research demonstrates that CoP participation significantly benefits individual professional development through multiple pathways. CoPs help shape professional identity, as participation influences how professionals see themselves and make career decisions (Chang, 2021; Jørgensen & Keller, 2008). They provide networking and mentorship opportunities that increase confidence and create career planning opportunities (Gander & McInnes, 2021). Furthermore, CoPs facilitate skill development through collaborative learning, with Pyrko et al. (2017) finding that “thinking together” in CoPs creates safe spaces for reflection and tacit knowledge sharing, leading to skill enhancement.

While universities are increasingly recognized as crucial providers of professional education for working adults, and Communities of Practice have demonstrated significant benefits for professional development, research examining university-led CoPs designed specifically for working professionals remains notably scarce. Online and blended learning CoPs represent particularly accessible formats for working professionals, yet even within this domain, Smith et al. (2017) systematic review found that 78% of studies in higher education focus on course-level activities for students and faculty development, with only 22% addressing professional development. Although emerging case studies exist, such as those examining universities facilitating CoPs for social care practitioners (Hashem et al., 2024) and online CoPs for professional development (Abedini et al., 2021), research remains scarce on how working professionals transform through university-led CoPs, what factors trigger these changes, and what unique role universities play as neutral facilitators of cross-industry professional learning.

This gap is pronounced in the Japanese context as well, where documented cases of university-led CoPs for working adults remain virtually nonexistent. In response to this gap, the present study examines a leadership development program operated by a national university in Japan from 2019 to 2024. Through text mining analysis of participant self-reports, we investigate three research questions:

RQ1: What changes do working professionals experience through participation in a university-led CoP?

RQ2: What factors trigger these changes?

RQ3: What role does the university as facilitator play in these transformations?

Methodology

The Leadership Development Program

This study examines a university-led leadership development program for working professionals, operated by a national university located in Tochigi Prefecture, Japan. The program, which has been running since 2017, aims to cultivate regional leaders and promote community revitalization through cross-sector professional learning. Each cohort runs for two months with weekly hybrid sessions, combining online and in-person formats to accommodate working professionals' schedules.

The program embodies the three essential elements of a Community of Practice (Wenger, 1998; Wenger et al., 2002). First, it establishes a shared Domain focused on regional revitalization and leadership development, bringing together professionals who share concerns about local community challenges. Second, it creates a Community through structured interaction among cross-sector participants, facilitating learning through diverse professional perspectives. Third, it develops shared Practice through collaborative learning from regional role models—successful entrepreneurs, community leaders, and university faculty who demonstrate practical approaches to regional challenges. A distinctive feature is the final session, which serves not as a conclusion but as a “kick-off” for participants to implement action plans in their communities, embodying the program's emphasis on moving from reflection to action.

Data Collection

Although the program has been operating since 2017, the present analysis focuses on participant survey data collected between 2019 and 2024, when the standardized questionnaire was introduced. During this period, 172 individuals participated in the program across multiple cohorts. We collected data through an anonymous, voluntary end-of-program survey administered to all participants. The survey included one open-ended question: “What changes have you experienced before and after the program?” This question was designed to elicit participants' self-reported transformations without imposing predetermined categories, allowing for rich, authentic descriptions of their experiences. Of the 172 participants, 109 responded to the survey, yielding a response rate of 63.4%. The anonymous nature of the survey encouraged honest reflection while protecting participant privacy. The open-ended format generated qualitative data suitable for identifying patterns and themes in participants' transformation experiences.

Text Mining Analysis

We employed text mining methodology using KH Coder, a quantitative content analysis software developed by Japanese researcher Koichi Higuchi. According to the website of KH Coder, it has been utilized in over 8,000 research studies worldwide. The software enables systematic analysis of qualitative data through computational methods, reducing researcher bias while maintaining interpretive depth.

We conducted two primary analyses. First, frequency analysis identified the most commonly occurring words and themes in participants' responses, revealing dominant patterns of change and frequently mentioned concepts. Second, co-occurrence network analysis visualized relationships between concepts by examining which words appeared together in participants' responses. This analysis reveals how different aspects of transformation connect in participants' experiences, identifying clusters of related concepts that represent distinct dimensions of change. These analytical approaches allow us to extract patterns of change experienced by participants and identify factors that triggered these transformations through systematic examination of their self-reported experiences.

Participant Characteristics

While the survey data collection began in 2019, demographic information (e.g., age and occupational background) was collected only from 2021 onward. Of the 90 participants from 2021–2024 cohorts who provided demographic information (82.6% response rate for this subset), the age distribution revealed a concentration of mid-career professionals: nearly half (47.2%) were in their 30s, followed by 40s (33.7%), 20s (15.7%), and 50+ (3.4%). Regarding occupation, the majority (65.2%) worked in the private sector, reflecting the program's appeal to corporate professionals. The remaining participants included self-employed individuals (14.6%), public sector employees (14.6%), and smaller numbers from city council, NPOs, entrepreneurship, and unemployment. This diverse occupational mix created opportunities for cross-sector dialogue and mutual learning, with private sector professionals gaining insights from entrepreneurs and public servants, while public sector participants learned from business perspectives.

This cross-sector composition aligns with the program's design as a university-led CoP, where the university serves as a neutral convener bringing together professionals who might not otherwise interact in their daily work environments.

Results

Frequency Analysis

The frequency analysis identified the most commonly occurring words in participants' open-ended responses, providing insight into dominant themes of transformation. The three most frequent words were "think" (24 occurrences), "take" (22 occurrences), and "people" (20 occurrences). This distribution suggests that participants engaged in deep cognitive reflection throughout the program, while interpersonal interactions with instructors and fellow participants provided significant stimulation for their learning journey. The prominence of "think" indicates sustained engagement with reflective practice, while "take" suggests active engagement in implementing new approaches. The frequency of "people" underscores the social nature of learning within the CoP. Learning-oriented vocabulary appeared prominently in the responses. The words "learn" and "new" each occurred 18 times, while "community" (9 occurrences), "broaden" (9 occurrences), and "perspective" (12 occurrences) emerged frequently. This pattern demonstrates that participants experienced expansion of their worldview through the program, acquiring new knowledge and perspectives that extended beyond their existing professional frameworks. Action-oriented language also featured prominently in participants' descriptions. Words such as "start" (8 occurrences), "begin" (7 occurrences), and "action" (5 occurrences) reflect the program's explicit goal of moving participants from reflection to action. This linguistic pattern suggests that participants not only

contemplated change but also developed concrete intentions and plans for implementation in their professional and community contexts.

Table 1
The Result of Frequency Analysis

Word	Frequency	Word	Frequency	Word	Frequency
think	24	give	10	challenge	6
take	22	broaden	9	desire	6
people	20	community	9	get	6
learn	18	gain	9	how	6
new	18	more	9	Tochigi	6
become	14	something	8	action	5
feel	12	start	8	also	5
make	12	way	8	change	5
perspective	12	begin	7	confidence	5
realize	12	industry	7	even	5
own	11	knowledge	7	horizon	5
want	11	other	7	importance	5
work	11	work	7	increase	5
change	10	attitude	6	local	5
course	10	business	6	more	5

Co-occurrence Network Analysis

To understand how these concepts connect in participants' experiences, we conducted co-occurrence network analysis, which visualizes relationships between words by examining which terms appear together in responses. In this analysis, node size reflects word frequency, while edges (connecting lines) indicate co-occurrence strength—how often words appear together within the same response.

The network analysis revealed a structure consisting of four major clusters and two smaller clusters, naturally emerging from the strength of word co-occurrences without predetermined categorization. This emergent structure suggests that participants' transformations occurred across multiple interconnected dimensions, each representing a distinct but related aspect of their CoP experience. The clustering indicates that certain concepts consistently appeared together in participants' narratives, revealing meaningful patterns in how they conceptualized and articulated their changes.

environment would be best through the keywords ‘local community’ and ‘connections.’” This comment demonstrates how the CoP helped crystallize participants’ fuzzy aspirations into concrete goals grounded in local community context. The program provided both conceptual frameworks and social connections that enabled participants to envision specific pathways for community contribution.

Cluster 3 (Orange): Expanding Worldview and Knowledge

The third cluster contains “new,” “perspective,” “knowledge,” “broaden,” and “gain,” representing cognitive expansion through diverse input. This cluster captures the knowledge acquisition dimension of transformation, particularly the broadening of professional perspectives beyond participants’ existing frameworks. A participant described this expansion: “By listening to people from various industries, I was able to broaden my perspective and knowledge, and by exchanging opinions, I was able to discover new ideas.” This statement highlights how cross-sector dialogue functioned as a catalyst for cognitive growth. The CoP structure, bringing together professionals from diverse industries, created opportunities for perspective-taking and knowledge transfer that would not occur in single-industry professional development contexts.

Cluster 4 (Yellow): Cross-Industry Learning and Engagement

The fourth cluster includes “own,” “people,” “other,” “realize,” “work,” and “industry.” This cluster specifically addresses recognition of cross-industry wisdom's value and the decision to actively engage with professionals from other fields. While Cluster 3 focuses on knowledge acquisition, this cluster emphasizes the relational and networking dimensions of cross-sector learning. One participant expressed this realization: “I realized that the wisdom of other industries is very useful, so I decided to get more involved with people from other industries.” This comment reveals both cognitive recognition (realizing value) and behavioral intention (deciding to engage). The university’s role as a neutral convener becomes particularly evident in this cluster, as participants explicitly valued the cross-industry composition that the program facilitated.

Cluster 5 (Blue): Business Challenges and Local Context

The fifth cluster, smaller but significant, includes “business,” “start,” and “Tochigi” (the prefecture name). This cluster shows participants connecting program learning to concrete business initiatives within their local geographical context. The appearance of the specific place name suggests that participants were thinking about entrepreneurship and business development grounded in regional realities rather than abstract concepts. This cluster reflects the program’s explicit focus on regional revitalization, demonstrating that participants internalized the connection between their professional development and local community development. The co-occurrence of “business” and “Tochigi” indicates participants were considering how to apply entrepreneurial thinking to address regional challenges.

Cluster 6 (Purple): Mindset Change and Attitude Shifts

The sixth cluster contains “change,” “way,” “attitude” and “work” representing fundamental shifts in participants’ approaches to work and problem-solving. This cluster captures metacognitive awareness of transformation—participants recognized that their thinking patterns and professional attitudes had evolved through the program. Unlike the other clusters

that focus on specific types of learning or action, this cluster represents participants' awareness of their own transformation process. This metacognitive dimension suggests the program successfully fostered reflective practice, enabling participants to recognize and articulate changes in their professional mindsets and approaches.

Discussion and Conclusion

This study examined how working professionals transform through participation in a university-led Community of Practice in Japan. Text mining analysis of 109 participants' self-reported experiences revealed multi-dimensional transformations across six interconnected clusters. We now address each research question in turn.

RQ1: What changes do working professionals experience through participation in a university-led CoP?

The cluster analysis reveals that participants experienced transformation across five interrelated dimensions. First, cognitive transformation manifested through development of new perspectives and expanded worldviews (Cluster 3), with participants explicitly noting how exposure to diverse professional viewpoints broadened their thinking beyond existing frameworks. Second, behavioral transformation was evident in the shift from reflection to action (Cluster 1), with participants reporting increased propensity to implement new approaches rather than remaining in analysis paralysis. Third, social transformation emerged through building cross-industry networks (Cluster 4), with participants recognizing the value of professional connections beyond their immediate sectors. Fourth, professional transformation occurred as participants applied new insights to their work contexts, connecting abstract learning to concrete workplace challenges (Cluster 5). Fifth, personal transformation manifested through increased confidence and agency (Cluster 6), with participants demonstrating metacognitive awareness of their own development.

RQ2: What factors trigger these changes?

Analysis of participant responses identifies five key triggering factors embedded in the CoP's social environment. Social learning through interaction with diverse professionals provided the foundational mechanism, consistent with Wenger's (1998) emphasis on learning as social practice. Cross-industry exposure enabled participants to see possibilities from other sectors, challenging industry-specific assumptions and revealing transferable approaches. Role models—successful entrepreneurs and community leaders who served as instructors—demonstrated achievable pathways, making abstract concepts concrete through lived examples.

Community support created a psychologically safe space for deep reflection and exploration, reducing the risk associated with sharing challenges and experimenting with new approaches. Finally, the Tochigi regional context made learning personally relevant, grounding abstract concepts in participants' local business and community realities. This local anchoring appears particularly significant for regional revitalization goals, as participants explicitly connected their learning to place-based challenges (Cluster 5). These findings suggest that transformation in university-led CoPs results not from program content alone but from carefully designed social environments that activate multiple reinforcing learning mechanisms.

RQ3: What role does the university as facilitator play in these transformations?

By examining these questions, this research identifies four distinct roles through which universities serve as hubs for regional development: neutral convener, knowledge broker, learning designer, and local anchor. This contributes to understanding the unique value of university-led cross-sector professional communities.

As neutral convener, the university created a cross-industry space where professionals from diverse sectors could meet as equals, transcending organizational and sectoral hierarchies that might inhibit open dialogue in other contexts. As knowledge broker, the university actively connected different industries, perspectives, and experiences, curating diverse expertise that individual organizations could not assemble independently. As learning designer, the university structured the program to move participants systematically from reflection to action, with the final “kick-off” session explicitly transitioning from learning to implementation. This intentional design is evident in the cluster progression from cognitive transformation (Clusters 2 and 3) through recognition of learning opportunities (Cluster 4) to concrete action orientation (Clusters 1 and 5). As local anchor, the university grounded learning in the regional Tochigi context while introducing broader conceptual frameworks, linking local challenges to universal principles of leadership and community development.

These four roles distinguish university-led CoPs from both corporate training programs and informal professional networks. Unlike corporate programs that serve single organizations, universities can convene cross-sector participants. Unlike informal networks that emerge organically, universities can provide structured learning design. This unique positioning enables universities to serve as regional development hubs, cultivating local leaders while building social capital for sustained community revitalization.

Limitations and Future Research

This study has three primary limitations. First, data relies exclusively on self-reported experiences captured through end-of-program surveys, without behavioral observation or longitudinal follow-up to verify claimed transformations. Second, the cross-sectional design cannot track long-term impacts or determine whether reported changes persist beyond the immediate post-program period. Third, as a single case study of one regional university program, generalizability to other contexts remains uncertain. Future research should track participants longitudinally to measure sustained behavioral change and career outcomes. Comparative studies across multiple university-led programs in different regions would identify which design elements prove most critical for transformation. Combining survey data with observable indicators such as community engagement, career progression, or business outcomes would strengthen evidence for CoP impacts beyond self-perception.

Conclusion

This research demonstrates that university-led Communities of Practice offer powerful mechanisms for transforming working professionals across multiple dimensions simultaneously. By serving as neutral conveners, knowledge brokers, learning designers, and local anchors, universities can facilitate professional development that transcends organizational boundaries while remaining grounded in regional contexts. As technologies reshape professional landscapes and demand for lifelong learning intensifies, universities’ capacity to convene diverse stakeholders for structured cross-sector learning represents an

increasingly valuable contribution to both individual career development and regional revitalization. This study provides empirical foundation for expanding universities' role from traditional degree education toward becoming sustained hubs for professional and community development.

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Declaration of Generative AI and AI-Assisted Technologies in the Writing Process

The author declares that Claude was used in proofreading and refining the language used in the manuscript. The usage was limited to correcting grammatical and spelling errors and rephrasing statements for accuracy and clarity. The author further declares that, apart from Claude, no other AI or AI-assisted technologies have been used to generate content in writing the manuscript. The ideas, design, procedures, findings, analyses, and discussion are originally written and derived from careful and systematic conduct of the research.

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