Coworking spaces and creative communities: making resilient coworking spaces through knowledge sharing and collective learning

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ABSTRACT

Sharing of spaces enhances networking and collaboration in cultural and creative industries on both formal and informal levels. Nevertheless, there is a lack of awareness concerning coworking spaces (CWS) and their resilience through knowledge sharing in communities, especially in space-community-coworker interactions. The aim is to identify how CWS enhance their resilience through knowledge sharing in communities and develop collective learning in local creative ecosystems to promote adaptation. A total of 34 in-depth face-to-face interviews with CWSs founders or managers and seventeen creative entrepreneurs in selected CWS in Europe. Using content analysis by axial and selective coding of the collected primary data, groups of codes were eventually integrated to interpret the issue by its contextualization using grounded theory as a research approach in such qualitative study. Results suggest that CWS strengthen their resilience through cross-over innovation with diverse stakeholder engagement and spillover effects of knowledge sharing as a part of space resilience. These initiatives contribute to community resilience with a focus on entrepreneurial thinking and career development. CWS develop interactive learning models as initiatives to retain and attract creative entrepreneurs in communities. The paper concludes that CWS can develop a creative ecosystem with systematic collective learning engaging different stakeholders.

KEYWORDS

Coworking spaces; collective learning; creative industries; knowledge sharing; resilience

1. Introduction

Third places represented by Coworking spaces (CWS) are currently rising to support and develop creative and cultural industries in cities and regions. They assist with creating favourable conditions for creativity, presentation, and exhibition of outcomes associated with non-standardized production. There is a particular influence on education that might be implemented through various events ranging from lectures and workshops to conferences and exhibitions (Katz et al., 2015). CWS stimulates communities' development in the local creative economy through a combination of working and leisure time, often resulting in spontaneous cooperation between local creative production, research, and networking. Nevertheless, recent studies addressed the resilience of CWS exploring the corporate model contrasted with community-based practices dealing with social interactions and social changes in the geographical context they are situated in (Gandini & Cossu, 2019; Ivaldi et al., 2020). In addition, we assume that there are ongoing social changes in CWS in local communities due to the Covid19 pandemic that altered how CWS operates, engages, and develops as knowledge-intensive places in urban areas (Ceinar & Mariotti, 2021; Mariotti, Akhavan & Rossi, 2021).

The parallel between CWS and knowledge-intensive places is mainly in the co-existence of independent freelancers and micro-companies that enhance the local economy with project-based production, human resources development, and innovativeness (Mitev et al., 2019). A rapid transformation of working spaces

denotes open innovation approaches by various actors in the network that co-create in creative communities (Blackstone, Hage & McWilliams, 2016). The actors develop novelty approaches to working and spending leisure time to create vibrant communities. These principles might affect the selection of working and spending leisure time concerning work-life balance in CWS. The shift of managerial decisions should enhance knowledge creation and knowledge sharing for the interplay between places and networks that reflect interactions in communities to encourage resilience. We consider Parrino (2015) noting that the place is insufficient for interaction and networking as social proximity plays a vital role in facilitating knowledge flow in knowledge-intensive places. Thus, the paper aims to contribute to the fundamentals of places with social settings that nurture creativity and contribute to a local buzz with face-to-face interaction. Both contributions are essential for non-standardized production (Asheim, Coenen & Vang, 2007; Clare, 2013). Moreover, we assume the local buzz in the creative milieu can enhance the cultural and creative industries (CCI) focused on the creation, production and distribution of creative goods and services, which are based on innovation activities defining local identities of places and communities (Asheim, Coenen & Vang, 2007; Andres & Chapain, 2013). These structures further denote innovativeness and creativity in communities and their knowledge interaction.

Knowledge interaction in creative communities is empowered by learning to trust each other and develop unique ideas, experiences, knowledge, and skills in the collective mind through collective learning (Bugge, 2011; Andres & Chapain, 2013). Nevertheless, the role of communities in knowledge sharing was studied on the issues of typology of spaces, spatial colocation, and sharing behaviour (Castilho & Quandt, 2017; Boucken & Aslam, 2019; Rese, Kopplin & Nielebock, 2020). Gandini and Cossu (2019) stressed the role of the community-based model of CWS that maintains interaction in surroundings with political and social activism, which we believe play a vital role in resilience. Social activism supports the resilience of CWS through social changes of space in the territory (Ivaldi et al., 2020). Furthermore, we reflect on the research gap through social activism that supports communities' integrity that allows for adaptive resilience concerning the capacity to deal with disruptive forces and changing circumstances (Nilakant et al., 2014; Aldrich & Meyer, 2015). The motivation of the paper is to describe space-community-coworker resilience in CWS through collective learning and knowledge sharing. It presents an empirical study to study the links between diverse stakeholders in CWS, focusing on encouraging communities and spaces to achieve resilience. The paper identifies research questions on how CWS enhance resilience to knowledge sharing in communities and how they develop collective learning in local creative ecosystems.

Previous paragraphs of the paper were devoted to present the fundamental underpinnings of CWS and links with the CCI and the ongoing changes of scenery in work and life in the third places. These changes are getting the attention of creative communities with tendencies towards self-employment and co-existing in collaborative places. These principles are associated with face-to-face interaction based on both competition and collaboration with knowledge creation and sharing to enhance the competitiveness of non-standardized or project-oriented production. We address active communities which are enablers for adaptive resilience concerning learning from experience, sharing tacit knowledge, and leadership in creative ecosystems (Nilakant, 2014; Andres & Round, 2015). Thus, we aim to address space-community-coworker resilience in CWS through collective learning and knowledge sharing. Previous studies tackled similar research questions primarily addressing collaboration in knowledge transfer in CWS (Rus and Orel, 2015); knowledge transfer between communities with formal and informal relationships in CWS (Blagoev, Costas and Kärreman; 2019); and knowledge exchange in shared environments based on forms of proximity (Spinuzzi et al., 2018; Boucken and Aslam, 2019). Concerning resilience, we seek to provide an overview

of the multi-resilience of both spaces and their communities that share bottom-up logic instead of the top-down logic of corporate-based CWS. In addition to previous studies, the paper provides an insight into specifics of third spaces and their knowledge interactions in communities with micro-scale physical transformations discussed in Schmidt & Brinks (2017) and Mariotti et al. (2017). A critical methodological advantage of the paper is in the inductive reasoning that aims to discover, understand, and interpret the circumstances of resilient communities and resilient spaces.

2. Creative industries, ecosystem and communities

The concept of the creative industries is gaining recognition as it moves from the periphery of public policies into the common trend among developed countries around the globe. John Howkins (2002) defined it as the interface between economy, culture, and technology, with creativity as the main driver (Hartley, Wen and Li, 2015). While definitions may vary, the creative economy combines creativity, ideas, knowledge, and technology (Bakhshi, Hargreaves & Mateos-Garcia, 2013). These aspects converge on local ecosystems and networks of the CCI with direct and indirect innovation and creativity (Lazzaretti, Boix and Capone, 2008). In addition, the spatial concentration of the CCI stimulates the localization of non-creative industries (such as KIBS) and form a creative milieu (Coll-Martínez & Aruazo-Carod, 2017). Both creative milieu and local ecosystems create a potential for communities and their social resilience in creativity, adaptation, and flexibility in CWS. We consider McGranahan, Wojan, and Lambert (2010), who argue that creative communities are more inclined to adopt modern technologies in production processes and personal lives. Furthermore, these communities are often active in the local ecosystem, specifically in knowledge sharing between creative individuals. Knowledge sharing in the CCI with competence to combine and distribute knowledge supports decision-making and value creation in CWS (De Silvia, Howells and Meyer, 2018).

Both soft and hard factors for accommodating the creative class comprise flexible management systems that support individual and collective creativity and its use for innovation (DeFillippi, 2015). We reflect Stoneman (2010), who argues that the CCI generate innovations beyond the creative sector, taking the form of diffusion or spillover effects with cross-sectoral impact. The CCI can create innovative products and services that directly improve economic and social settings in local communities and beyond (De Propris, 2013). We also take into consideration indirect positive effects on the supply chain, particularly in the collaboration between producers and customers. However, the concept of creativity is difficult to measure as it is often subjective and thus constitutes a fundamental attribute of the CCI, leading to new and unconventional outcomes. CCI's innovation activities support project-oriented, non-standardized production, in which the outcome might be perceived as permanent innovation (Vinodrai, 2015). These innovation activities are associated with mobility of the workforce between projects and organizations, often encouraged in CWS.

Furthermore, the CCI might create a favourable milieu for cross-over (cross-industry) innovation in creative communities (Lazzaro, 2017). These network synergies can lead to the colocation of knowledge-intensive business services in hubs developing and intensifying the local buzz (Andres & Chapain, 2013). We believe the synopsis on collective learning in communities and networks remains vague, specifically considering the variety of projects and organizations that occur in CWS.

The positive benefits of creative ecosystems are not limited solely to the market but extend to related institutions and communities. An increase in demand and supply of products in CCI contributes to linking various knowledge-based services rooted in place, traditions, and culture (De Propris, 2013). The local creative ecosystems stimulate both the sustainability and absorption capacity of innovation activities among freelancers and micro-enterprises in creative communities (O'Connor & Gu, 2014). We assume developing local creative ecosystems reflects the need for sustainable development that requires balanced and harmonized cultural diversity, environmental responsibility, and economic viability in CWS. Creative ecosystems could achieve these objectives through the effects they generate on communities in the urban context, specifically in the CCI agglomeration and city image (Coll-Martínez & Méndez-Ortega, 2020).

Nevertheless, these synergic effects of the economic and social framework that the local creative ecosystem offers might be neglected concerning the perception of CCI and their influence on competitiveness in creative communities. Concerning previous studies, we consider ambiguities in the development of creative communities through learning initiatives. Based on studies addressing the creative ecosystem and innovation, we identify the following research question concerning knowledge dynamics in creative communities.

RQ1: What incentives and actions of collective learning do CWS implement to develop creative communities?

We assume the governance of CWS is facing challenges to shift towards new sources of viability and sustainability. These changes are taking place at regional and local levels similarly. To support CWS role in developing the local creative ecosystem, the local government should aim to develop networks concerning flexible working conditions to stimulate engagement and collaboration in solving common issues (Blackstone, Hage & McWilliams, 2016).

3. Coworking spaces and their resilience

Coworking spaces are part of the sharing economy that penetrates the CCI with the development of communities that form not only in urban and regional centres but also on the periphery (Jamal, 2018). Flexibility in CWS encourages new ways of production and distribution to allow various subsectors to create synergies. These processes might refer to disorganization that symbolizes functional autonomy, horizontal integration, and decentralized control (Blyton & Morris, 2017). Creative communities concentrate on structures that allow them to be cooperative and encourage collective learning (Carta, 2009; Parmentier & Mangematin, 2014). According to Merkel (2018), community-based CWS create new infrastructures for freelance work with flexibility and independence.

On the contrary, the corporate-based model of coworking is more inclined towards top-down logistics of space-sharing among workers (Gandini & Cossu, 2019). Community-based CWS are more inclined to emphasize sharing and adapting different actors within the various levels of governance to achieve community resilience of social capital and networks (Aldrich & Meyer, 2015). Andres and Round (2015) advocate for the resilience of the CCI based on production, space and people. CWS provide alternatives to encourage inter-firm relations in informal networks that allow for knowledge interactions on a micro-level with the refusal of top-down logic (Gandini & Cossu, 2019). Thus, bottom-up logic enhances practices towards adaptive resilience to implement reorganization on leadership management of the CCI (Aldrich & Meyer, 2015). Therefore, the CWS is promising considering the capacity to cope with disturbance or more likely to maintain creativity in the face of change in the local creative milieu at urban and rural level (Blackstone, Hage & McWilliams, 2016). We consider the tendencies relocation of creative entrepreneurs to more rural areas (Pareja-Eastaway, 2016). Respecting previously discussed studies dealing with the CCI and resilience on urban and rural levels, we identified the following research question on multi-resilience of communities and spaces of the third places:

RQ2: How do knowledge interactions in communities enhance the space resilience of CWS?

Resilient communities in CWS might be a source to enhance the resilience of spaces (Banks and Cunningham, 2016). Likewise, those principles are relevant for rural areas as creative activities tend to be more community-focused with adaptive approaches to overcome barriers (Aldrich & Meyer, 2015; Roberts and Townsend, 2016). Creative entrepreneurs are embedded in their communities in rural areas, focusing on evolving cultural capital in the local creative ecosystem (Pareja-Eastaway, 2016). Andres and Round (2015) discuss that creative workers involved in informal networks create the potential to overcome local production, space, and human resources barriers. Informal networks in embedded communities of creative entrepreneurs cultivate a creative milieu, particularly in the association between entrepreneurship and place (Coll-Martínez & Arauzo-Carod, 2017).

4. Methodology

The research in this paper follows an international project focused on "Establishment", running and development of Coworking Centres with the possibility to establish on the premises of universities to retain the CCI". This comprehensive scope was based on mixed-method research on studying the development trajectories of CWS in the EU focusing on the resilience and sustainability of third spaces. It was aimed to gain an in-depth understanding of the role of spaces, managers, and communities in knowledge strategies. The first step in the conducted research design was to identify active CWS from the EU perspective to

distinguish their basic features. CWS were detected by their activities and the year of establishment, particularly those familiar with the CCI as a target group, reflecting purposive sampling as the first step of both projects and this paper (Patton, 2014). The selected EU member states, namely Austria, Germany, Denmark, Sweden, Finland, Estonia, Latvia, Poland, and Slovakia, were found relevant due to their current approaches towards advancing CCI as a source for social and economic development (Menger, 2013). CWS in the sample were at least two years of presence on the market, which emphasises their sustainability. Spatially, the sample consists of cities located in both core and peripheral areas of the given countries. It includes CWS focused on the CCI with a mix of profit and non-profit branches to tackle communities and their tendency to develop the local creative ecosystem. A vital advantage of this methodological perspective is reflected in a diversity of cultural and creative capital for the successful advancement of CCI within CWS. It also supplements the methodology considering different cultural settings.

The surveyed data were collected through face-to-face semi-structured interviews with both managers and CCI entrepreneurs, acquired between March and May 2017. Managers and entrepreneurs were located in the following cities: Linz, Berlin, Copenhagen, Stockholm, Helsinki, Tallinn, Riga, Warsaw, and Trenčín, representing mainly capital cities. However, the two cities are located in peripheral areas. The total sample consists of 34 respondents out of whom sixteen were male respondents and eighteen female respondents, keeping a gender-balanced sample with managers and at least one creative entrepreneur in each CWS. To capture comprehensive survey data, all interviews took ninety minutes, where sixty minutes were devoted to managers and thirty minutes to creative entrepreneurs. The purposive sampling was focused on managers' professional experiences and activities, along with a snowball sampling (including the eight managers), where respondents were asked to identify other respondents to enrich the total sample respecting the best practices in the development of CWS. The selection of respondents was discussed by the research team to limit the volunteer bias, along with the issue related to errors of judgement by the research team (Patton, 2014). The sample comprises seventeen randomly selected managers representing entrepreneurs in the CCI, more specifically activities related to artistic creation, design, architecture, videogames. This step was undertaken to ensure a diverse pool of CCI entrepreneurs in the paper and limit volunteer bias. The timeframe of the conducted interviews was selected to involve direct contact between the researcher and respondents in a more extended period.

The primary task of the conducted interviews was to gather information from the respondents concerning the forms and processes of collective learning and knowledge sharing and how they experience them with their meaning and interpretation. Interviews included an introduction, two specific blocks of questions, and a closing discussion with a different set of questions for managers and entrepreneurs. The first block was focused on learning events in CWS concerning enablers and barriers of collective learning - building trust, networking, and collaboration settings. The second block consists of questions investigating knowledge interactions and communities in CWS – the role of managers inflow of knowledge, stakeholder engagement and community development through trust, collaboration settings, knowledge strategies. Both blocks of questions were designed to receive responses from managers and entrepreneurs about their experiences in developing resilience of spaces through learning events and knowledge interactions. Respondents could share their understanding of enablers and barriers, along with perceived changes in the spaces and the impact of CWS on community development. Both selective and axial coding were employed as a systematic qualitative approach derived from data sources obtained from semi-structured interviews.

Subsequently, the thematic data analysis was based on a constant comparison of categories and their conceptualisation based on literature sources, which implies analysing the data repeatedly using a constructivist paradigm (Creswell and Poth, 2018). The examination consisted of three recurrent stages of coding to deconstruct and conceptualise the data to develop semantic units as conveyors of information. Axial and selective coding about community–organisation–space nexus was case-specific due to data collection, analysis, and integration of groups towards the theoretical concepts (Urquhart, Lehmann and Myers, 2010; Creswell and Poth, 2018). This method allows seeing truth and meaning as constructed and interpreted by individuals of selected CWS. A register of codes was developed for systematic categorisation into more subcategories that are general and subsequently to categories. Procedures of categorisation (creating groups of codes) were recurrent during the data analysis supporting their validity. The qualitative analysis procedure is consistent with Bednář and Danko (2020), with constant comparisons of codes and groups leading to their refinement, especially when their meanings were similar.

Nonetheless, this procedure might be affected by the lack of rules to identify codes and groups (Faggiolani, 2011). Misinterpretation and fuzziness of data might affect coding, categories, and subcategories, denoting managers and creative entrepreneurs (Kapoulas and Mitic, 2012). The process of coding, creating groups of codes, and consequential integration of groups towards the theoretical concepts were carried repeatedly by the research team to address their connotations. This step was undertaken to be more concerned with the depth and intensity of interactions in CWS dynamics within managerial and entrepreneurial perceptions. Following the methodological approaches developed by Rowlands (2005), pattern matching was used to reduce large amounts of data into smaller units. The qualitative analysis procedure consists of recording, transcribing, coding and classifying based on literature sources and subsequent integration of categories to theoretical concepts.

5. Findings

Overview

Results indicate that CWS positively promotes CCI in particular cities due to establishing and developing a local creative ecosystem. CWS experienced a higher interest from diverse stakeholders in education within the CCI. The respondents also highlighted that CWS create favourable workspaces that stimulate creativity and community development through interactive learning models encouraging collective learning. These activities go beyond the CCI, with learning initiatives are focused on entrepreneurial and communication skills. Variability in spaces for work and leisure time, along with relaxing zones and green places, are essentials for attracting the CCI and their activities, signifying place uniqueness (Gandini & Cossu, 2019). Results imply that collective learning depends on continuous networking and supporting joint projects to stimulate communities to generate ideas and novelty in the creative ecosystem. Interviews revealed that learning events nurture relationships between creative communities and neighbourhoods to raise awareness about new working spaces. These links resulted in more efficient fundraising for developing CWS and their interactive learning models in the end. Even though there were no significant differences in responses on the topic mentioned below, certain research limitations need to be considered respecting diverse approaches to knowledge sharing and collective learning.

Resilience and community

The findings indicate that CWS play a vital role in community development. Respondents emphasized that new working spaces are bridging different branches of the CCI together, which might enhance progress in cross-over innovation. It might be attributed to the fact that managers and entrepreneurs are open to interactive learning models that allow for open and user-oriented innovation. CWS represent favourable workspaces that stimulate creativity and community development towards social resilience, where members are keener to participate in events that bring different stakeholders together. Interactive learning models support the development of soft and hard skills of entrepreneurs in CWS, primarily through community engagement that allows for multidisciplinary approaches that are unambiguous for the CCI (Andres & Round, 2015). Multidisciplinary collective learning benefits communities in CWS with new skills, which are scarce in creative branches, i.e., entrepreneurial thinking and sustainability (Gandini & Cossu, 2019).

"*Diversity of skills and expertise in creative fields is actually what brings us together. It helps with coming up with new ideas, especially when we feel less creative"*

(CWS manager, Helsinki)

The results also suggest CWS are more inclined towards resilience associated with governance that could react to rapid changes in the CCI due to digital media. These changes require effective teamwork to find new ways to deal with disruptive and radical innovations not only in digital media but currently due to the Covid19 pandemic. Adaptive resilience could also be attributed to continuous networking and leadership at both the top and middle-level supporting joint activities that generate new ideas and problem-solving skills. These principles require initiatives to become agile and coordinated to learn rapidly. As a result, creative communities effectively absorb disturbances affecting the creative economy, specifically in changing digitalisation circumstances and disruptive innovation (Boucken & Aslam, 2019).

Moreover, CWS enhance the collaboration of different CCI branches that might unlock a new way of increasing local competitiveness. Respondents stressed the need to create a favourable environment for learning, which is based on community development. Community-based CWS help generate ideas for mutual learning and creates opportunities for members to experience novelty in the CCI, particularly in the diverse activities of members in CWS. Collective learning catalyses dynamic and cumulative processes for creating knowledge concerning similarities and differences in production processes in the CCI. The respondents reasoned that this aspect is based on mutual trust and the ability to combine knowledge and experience to form ideas for project-oriented production in an open-minded manner. These principles underline the role of CWS as a fourth place that combines elements of the second and third place as coworking heading towards a new environment for knowledge interaction.

"It often feels like playing with a puzzle, combining various pieces together, particularly in mutual projects and activities"

(CWS entrepreneur, Berlin)

Creative ecosystem development and collective learning

Interviews highlighted that CWS have potential and serve to create new jobs to retain advantages agglomeration economies to attract creative entrepreneurs forming network effects. In addition, network

effects create a potential for dialogue with local stakeholders in communication and relationships towards joint projects and collaboration. The respondents mentioned strategic collaboration with local stakeholders, which could develop effective city marketing and authentic brands within a creative ecosystem resulting from the exchange of innovative ideas because of the proximity. A creative ecosystem signifies a network of individuals and their interactions as culture-based contextual conditions for mutual learning, including opportunities to use their knowledge, skills, and experiences developing Marshall–Arrow–Romer spillover (Neffke et al., 2011). These synergies represent horizontal cooperation between various stakeholders that allows for the mobilization of resources for learning-based processes of innovation and change in local communities, with Jacobs spillover effects in facilitating innovation activities and knowledge dynamics.

Table 1 shows learning-based activities are a vital part of cross-over innovation within the CCI, to impact skills development and strategic collaboration of entrepreneurs and management in CWS. The respondents stressed the role of collaboration for skills development, particularly those not natural for the creative class. Skills development in CWS signifies a community of practice as entrepreneurs share a passion for learning and doing better as they regularly interact in creative branches. In some cases, collective learning based on the community of practice was supported by public authorities, particularly in resource allocation, to develop a creative ecosystem towards the functional autonomy of CWS. However, the responsiveness of public authorities to support collective learning in CWS might be an issue without strategic partnerships. Managers expressed that CWS still face adversity in building long-term partnerships with public authorities, primarily due to instability in local governments. The instability generates certain pressure on developing sustainable platforms for collective learning with a learning-based process of innovation and change.

"Education is one of the main pillars. We regularly organize lectures for the general public to raise awareness about the creative industries and to present current trends."

(CWS manager, Tallinn)

"Our community is devoted to education in creative industries and we do it through workshops and spontaneous projects. Public authorities noticed our activities and approached us to support our activities."

(CWS manager, Copenhagen)

Table 1. Data structure (groups and codes) and their integration to concepts of collective learning in CWS

Groups	Description (codes)	Integration to concepts
Strategic collaboration	Creative-local communities	Community of practice (Blagoev, Costas & Kärreman, 2019
	Problem-solving skills	
Learning platform	Entrepreneurial thinking/learning	Boosting entrepreneurship (Suire, 2018)
	Learning-based informal activities	
Cross-over innovation	Project-oriented production	Open innovation (Blackstone, Hage & McWilliams, 2016)
	Spillover effects	
Project-based organization	Local partnerships and trust	Adaptive resilience (Aldrich & Meyer, 2015)
	Interactive learning events	

Entrepreneurs expressed motivation to participate in CWS due to their favourable environment for stimulating collective learning and production (Bugge, 2011). Communication outside CWS with local communities was identified as a critical aspect in collective learning, specifically in generating interest to participate in parts of the communities outside of CWS promoting social change (Ivaldi et al., 2020)). Interviews suggest that CCI entrepreneurs prefer flexible workspaces systems that stimulate networking opportunities, and effective working model that nurtures cross-over innovation, including both producers and consumers in the process (DeFillippi, 2015). Figure 1 points out that both managers and CCI entrepreneurs identified the importance of raising awareness of CCI and creative spaces to the public through collective learning as a concept for bridging different perspectives and engaging various stakeholders in the process of production. CWS represent a suitable environment for joint learning in problem-solving, particularly in project-oriented production that might encounter everyday issues.

Joint learning represents a cycle of learning and doing that is often supplemented with story-telling to share experience among creative entrepreneurs. To include external stakeholders outside of CWS, managers stressed the need to establish platforms for collective learning, especially learning events, i.e., training programs, interactive workshops, and seminar series. Learning events are not merely planned activities, as they might happen spontaneously among CWS members and external stakeholders, similar to Kojo and Nenonen (2017). An essential element is how CWS store knowledge outputs to build a database of knowledge. Results suggest that a database of best practices that reflects practical experience from joint projects serves as a tool for collective learning. However, a lack of a systematic approach to store the outputs of collective learning was identified. Some outputs are digitalized and stored in databases for knowledge management (Boucken & Aslam, 2019). Infographics and short manuals represent an additional way to share outputs within CWS. Both approaches require competent management as an essential feature to store and share knowledge at community level. Results suggest that collective learning in CWS combines input knowledge in local communities and enhances the production of output knowledge based on knowledge interactions. Respondents emphasized the role of collective learning in changing the scenery and building a brand for the local creative ecosystem that attracts other creative entrepreneurs (Mitev, 2019).

CWS and knowledge sharing

The evidence indicates that mutual learning events, which interlink different stakeholders, create an innovation network. Learning events further enhance social networks that help members to share knowledge in the context of community resilience. Various branches united in CWS have different perspectives and experiences that lead to business development by enhancing knowledge spillover effects. These effects diffuse beyond the place they originated in with systematic knowledge management. The community of practice in CWS embodies a tool to enhance local competitiveness and thereby resilience of third spaces (Morrison, 2018). Local buzz correspondingly represents a form of sharing through continuous networking that creates new ideas and projects. In that case, systematic knowledge interactions embedded knowledge sharing in CWS can develop an intensive innovation ecosystem. Informal interactions create synergic effects between coliving and coworking elements to facilitate physical places, enhancing knowledge interactions to achieve space resilience (Gandini & Cossu, 2019). Physical knowledge interactions contribute to the resilience of communities and spaces to avoid shocks of the digitalization of the CCI.

Conversely, these interactions face challenges due to the Covid19 pandemic that moved the most physical interactions to the virtual scene. Nonetheless, the respondents pointed out that informal processes of sharing tacit knowledge allow entrepreneurs to become more competitive and cope with the progressive use of ICT in those CCI branches, which are not primarily driven by profit. Figure 2 indicates that CWS contribute to communities' adaptive resilience to some extent, particularly in knowledge interaction that helps entrepreneurs overcome challenges in entrepreneurial activities and adapt them to the particular entrepreneurial environment. Such benefits could support cultural production that profit from tacit knowledge, especially with CWS contribution to knowledge Jacobs spillover effects concerning various creative entrepreneurs (Neffke et al., 2011). The effects of CWS occur in changing the behaviour of creative entrepreneurs towards human resource development by entrepreneurial thinking and leadership management in the context of space resilience. In case of knowledge sharing is encouraged daily, and managers are actively seeking opportunities for members to be involved in knowledge interactions.

"We are actively looking at opportunities to improve the skills of our members and encourage them to do so and share with everyone."

(CWS manager, Berlin)

Multidisciplinary skills (creative, cultural, entrepreneurial) are essential for the CCI to run sustainable and viable businesses. However, the capacity for skills development might be limited due to the entrepreneurial activities of the CWS members. Findings suggest that primarily formal initiatives for knowledge sharing have to be carefully organized, respecting time management. CWS managers are used to gather data on feedback for knowledge interactions, specifically to understand what CCI entrepreneurs currently require to be competitive (Mitev et al., 2019). Barriers to knowledge sharing are related to difficulties in organizing large-scale events, but they were identified as essential for associated social activities for networking. The respondents emphasized that exhibitions are necessary to bridge the artistic and natural world and raise awareness of the CCI. Knowledge interactions in small-scale events are more effective for learning models, where the CCI's specific knowledge outputs are shared straightforwardly. Limited capacity at small-scale events reflects the pros and cons for CCI entrepreneurs in the creative ecosystem. The results indicate a focus on quality rather than quantity, particularly concerning knowledge sharing. CWS managers and CCI entrepreneurs affirm the role of mingling among the strengths of CWS. Mingling is more relaxed without specific requirements and prerequisites for stakeholders with the potential benefit to attract people and other communities to the local creative ecosystem (Morrison, 2019).

"Our regular design workshops attracted more and more participants and we were getting applications to join that went over the board. That was actually our most effective marketing campaign."

(CWS manager, Stockholm)

Entrepreneurs in the CWS agreed on increasing the attention of various stakeholders (public authorities, residents, tourists, entrepreneurs) to participate in learning events, exhibitions, and creative workshops. The increased attention could be interpreted as better communication between what the respondents refer to as the natural world and the artistic world. These links are connecting various stakeholders and increase awareness of the CCI. Creative communities in CWS attract interest from residents that result in tacit knowledge sharing based on the community of practice. Engagement of residents and public administration

supports knowledge creation and diffusion. Table 2 presents the principal codes and groups towards the integration of knowledge sharing in CWS.

"We are open to people who are interested in what we are passionate about – creative artistic world. That is why we bring our projects closer to people in the neighbourhood."

"Some of our most successful projects kick-started while we were having a coffee relaxing in the garden."

(CWS manager, Linz)

Table 2. Data structure (groups and codes) and their integration to concepts of knowledge sharing in CWS

Groups	Description (codes)	Integration to concepts
Knowledge sharing	Linking stakeholders	Adaptive resilience (Aldrich & Meyer, 2015)
	Informal learning events	
Community-space	Systematic interaction	Retention /attraction of the CCI (McGranahan, Wojan & Lambert, 2010)
	Awareness of the CCI	
Skills development	Stakeholder engagement	Community-based model (Blagoev, Costas & Kärreman, 2019
	Knowledge diffusion	
Interactive learning models	Creativity and entrepreneurship	Knowledge base (Parrino, 2015)
	Bridging creative and real world	

We conclude that CWS could be considered a platform for commencing, maintaining, and developing interactive learning models and links between entrepreneurs, government, and local communities. Nevertheless, there are placed-based learning models that are challenging to recreate and replicate in different settings. This challenge is difficult to overcome in knowledge sharing practices as we recognised both formal and informal knowledge management strategies among respondents. We believe CWS could play a vital role in developing resilient communities, specifically by economic and adaptive resilience, where learning is based on experience and systematic collaboration to adapt and overcome the current challenges of the third places. Results revealed that informal knowledge interactions (primarily in Swedish and Finnish CWS) are prevailing, even though certain approaches towards explicit knowledge sharing, such as the community of practice (German and Austrian CWS). Despite the synergies between knowledge interactions and community development, collective learning and events need to meet local conditions and a creative environment to avoid a one-size-fits-all approach. We recognise that CWS generally represents a favourable environment to stimulate innovation networks and spillover effect to the local creative ecosystem. These indirect effects do not occur spontaneously. They require ambitious planning and implementation respecting the local specificities of spaces and their communities. Some CWS stated difficulties in achieving spillover effects due to CCI entrepreneurs' diverse expertise and business models. Managerial implications of results of the study show that managers and facilitators are encouraged to systematically monitor and evaluate considering various stakeholders and their diverse needs to nurture a favourable environment. Those managerial implications put pressure on management to develop skills and expertise reflecting dynamic environments in CWS. Local creative ecosystems often deal with fluctuations

in communities with various creative entrepreneurs, which makes it challenging to develop strategic collaborations to enhance resilient spaces. These concerns entail organised initiatives of managers and facilitators for CCI retention and attraction to community-based models and stakeholder engagement.

6. Discussion and conclusions

The paper contributes to discussing the resilience of space-community-coworker nexus through knowledge sharing in communities and collective learning in local creative ecosystems. Similarly, it presents an overview of the dynamics of knowledge strategies in community-based CWS based on bottom-up logic as opposed to top-down logics that incorporate models of coworking. Concerning RQ1 on the resilience of CWS, the paper validates the notion that CWS present a favourable environment for collective learning, supporting the adaptive resilience of communities in the CCI (Andres & Round, 2015). Resilience is driven by learning from experience and sharing tacit knowledge in the community-based model of knowledge interactions described by Capdevila (2018). The community-based model enhances collective learning in CWS, specifically by engaging creative entrepreneurs and local stakeholders with multidisciplinary skills that benefit the resilience of communities in CWS. Our findings contribute to Boucken & Aslam (2019) and Rese, Kopplin & Nielebock (2020) with an insight into the role of entrepreneurial learning, which helps to boost entrepreneurship and develop entrepreneurial thinking in branches that not primarily for profit. In the case of community development, the paper supports the findings by Spinuzzi et al. (2018) claiming that organisational and social proximity stimulates collaboration among diverse stakeholders to bring novelty (processes innovation, new trends, CCI expertise) to the local creative ecosystem. Results provide insight into interventions in CWS on knowledge sharing through the community of practice with learning from best practices and regular interaction during the workshop (see McLean, 2014).

On the contrary, these interventions might also contribute to economic inequalities in various abilities to absorb knowledge in communities, precisely due to the diverse branches of the CCI located in CWS. We identified social inequalities and limited engagement of stakeholders without prerequisites of project-oriented production in community-organisation-space nexus argued by Schmidt and Brinks (2017) and Eikhof and Warhurst (2013). Respondents stressed the role of CWS as a platform to link seemingly different concepts and engage various stakeholders in production. On the contrary, these differences might highlight both economic and social inequalities in creative communities (profit vs non-profit).

In the case of RQ2 on collective learning and innovative, creative ecosystem, we integrated the theoretical concepts of collective learning based on the substantial use of interactive learning models that encourage cross-over innovation. Cross-over innovation resulted from multi-stakeholder engagement and collaboration with project-oriented production develops the results in Parmentier and Mangematin (2014) and Lazzaro (2017). These processes underline the role of CWS in bridging the artistic and conventional movement as a contribution to challenges of the creative economy, as emphasised by Hartley, Wen and Li (2015). The results indicate the importance of dynamic knowledge management and systematic learning events to create synergies in the innovation activities of creative entrepreneurs (Andres & Round, 2015; Boucken & Aslam, 2019). On the other hand, we believe these synergies might contribute to uneven local development, particularly in CWS that gained competitive advantages. As opposed to O'Connor and Gu (2014), creative communities in CWS tend to strengthen relationships between government, entrepreneurs, and neighbourhoods, primarily in nurturing a creative ecosystem. It signifies interactive learning models in raising awareness of the creative economy and its impact on creative community development, supporting

the findings by Chan and Zhang (2018). Collective learning and knowledge sharing shed some light on current trends in the creative economy. The paper also contributes to the study by Kojo and Nenonen (2017) where knowledge sharing practices, specifically cultivating their economic resilience and sustainability through local partnerships, project-oriented production, and local competitiveness were identified as drivers of the CWS development.

The study has certain limitations due to using a qualitative research approach. Firstly, an inability to generalise findings in knowledge sharing and collective learning in CWS. Conversely, the sample includes the different social, economic, and cultural settings in which CWS operate. The settings helped recognise similarities and diversity in the CWS. Furthermore, the paper addressed the CCI in CWS, limiting the findings primarily to communities linked to the creative economy. We assume that these communities bring together diverse entrepreneurs, not only the CCI ones.

Furthermore, the accomplished results of the study must not entirely depict the current reality because all interviews had been performed before the COVID-19 pandemic. Furthermore, the resilience of CWS addresses a variety of restrictions and initiatives for coping with the impact of the Covid-19 pandemic. Finally, the paper addressed the specifics of economic sustainability and boosting entrepreneurship of CWS ambiguously due to missing research on the direct economic effects of CWS on local creative ecosystems.

Further research is anticipated to be devoted to increasing the understanding of synergies between various stakeholders in organisational studies. Ongoing investigations would tackle the research gap in studies on interactions between policymakers and creative ecosystems. These studies could advocate tailored public policies to support the development of CWS that would reduce urban economic and social disparities. The results could assist both practitioners and public authorities with engagement and practice in collective learning and knowledge sharing towards sustainable spaces and their communities in the local creative ecosystem.

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References

Aldrich, D. P., & Meyer, M. A. (2015). Social capital and community resilience. *American behavioral scientist*, 59(2), 254-269.

Andres, L., & Chapain, C. (2013). The integration of cultural and creative industries into local and regional development strategies in Birmingham and Marseille: towards an inclusive and collaborative governance?. *Regional Studies*, 47(2) 161-182.

Andres, L., & Round, J. (2015). The creative economy in a context of transition: A review of the mechanisms of micro-resilience. *Cities*, 45, 1-6.

Asheim, B., Coenen, L., & Vang, J. (2007). Face-to-face, buzz, and knowledge bases: sociospatial implications for learning, innovation, and innovation policy. *Environment and Planning C: Government and Policy*, 25(5), 655-670.

Bakhshi, H., Hargreaves, I., & Mateos-Garcia, J. (2013). *A manifesto for the creative economy*. NESTA. Retrieved from: http://orca.cf.ac.uk/49323/1/A-Manifesto-for-the-Creative-Economy-April13.pdf

Banks, J., & Cunningham, S. (2016). Creative destruction in the Australian videogames industry. *Media International Australia*, 160(1), 127-139.

Bednář, P., & Danko, L. (2020). Coworking spaces as a driver of the post-fordist city: A tool for building a creative ecosystem. *European Spatial Research and Policy*, 27(1), 105-125.

Bontje, M., & Musterd, S. (2009). Creative industries, creative class and competitiveness: Expert opinions critically appraised. *Geoforum*, 40(5), 843-852.

Blackstone, M., Hage, S., & McWilliams, I. (2016). Understanding the role of cultural networks within a creative ecosystem: a Canadian case-study. *Journal of Cultural Management and Policy*, 6, 13-29.

Blagoev, B., Costas, J., & Kärreman, D. (2019). 'We are all herd animals': Community and organizationality in coworking spaces. *Organization*, 1-23.

Blyton, P., & Morris, J. (2017). *A Flexible Future?: Prospects for Employment and Organization.* Walter de Gruyter GmbH: Berlin. ISBN 978-3110863345.

Bouncken, R., & Aslam, M. M. (2019). Understanding knowledge exchange processes among diverse users of coworking-spaces. *Journal of Knowledge Management*, 23(10), 2067-2085.

Braun, V., Clarke, V., Hayfield, N., & Terry, G. (2018). Thematic analysis. *Handbook of research methods in health social sciences*, 1-18.

Bugge, M. M. (2011). Creative distraction: Lack of collective learning in adapting to online advertising in Oslo, Norway. *Industry and Innovation*, 18(02), 227-248.

Capdevila, I. (2018). Knowing communities and the innovative capacity of cities. *City, Culture and Society*, 13, 8-12.

Carta, M. (2009). Culture, communication and cooperation: the three Cs for a proactive creative city. *International Journal of Sustainable Development*, 12(2-4), 124-133.

Ceinar, I. M., & Mariotti, I. (2021). The effects of Covid-19 on coworking spaces: patterns and future trends. *New Workplaces—Location Patterns, Urban Effects and Development Trajectories: A Worldwide Investigation*, 277-297.

Clare, K. (2013). The essential role of place within the creative industries: Boundaries, networks and play. *Cities*, 34, 52-57.

Coll-Martínez, E., & Arauzo-Carod, J. M. (2017). Creative milieu and firm location: An empirical appraisal. *Environment and Planning A*, 49(7), 1613-1641.

Coll-Martínez, E., & Méndez-Ortega, C. (2020). Agglomeration and coagglomeration of co-working spaces and creative industries in the city. *European Planning Studies*, 1-22.

Chapain, C., & De Propris, L. (2009). Drivers and Processes of Creative Industries in Cities and Regions. *Creative Industries Journal*, 2(1), 9-18.

Creswell, J. W., & Poth, C. N. (2018). *Qualitative inquiry and research design: Choosing among five approaches*. Sage publications.

DeFillippi, R. (2015). Managing project-based organization in creative industries. *The Oxford handbook of creative industries*, 268-283.

De Propris, L. (2013). How are creative industries weathering the crisis? *Cambridge Journal of Regions, Economy and Society*, 6(1), 23-35.

Faggiolani, C. (2011). Perceived identity: Applying grounded theory in libraries. *JLIS. it*, 2(1).
Gandini, A., & Cossu, A. (2019). The third wave of coworking: 'Neo-corporate'model versus 'resilient'practice. *European Journal of Cultural Studies*, 24(2), 1-18.
Ivaldi, S., Galuppo, L., Calvanese, E., & Scaratti, G. (2020). Coworking space as a practised place between welfare working and managerial challenges. *Journal of Workplace Learning*, 33(1), 26-44.
Jamal, A. C. (2018). Coworking spaces in mid-sized cities: A partner in downtown economic development. *Environment and Planning A: Economy and Space*, 50(4), 773-788.
Kapoulas, A., & Mitic, M. (2012). Understanding challenges of qualitative research: Rhetorical issues and reality traps. *Qualitative Market Research: An International Journal*, 15(4), 354-368.
Katz, B., Vey, J. S., & Wagner, J. (2015). *One year after: Observations on the rise of innovation districts*. Washington: Brookings.
Kojo, I., & Nenonen, S. (2017). Evolution of co-working places: drivers and possibilities. *Intelligent buildings international*, 9(3), 164-175.
Lazzaro, E. (2017). Cultural and creative entrepreneurs. In *Culture, Innovation and the Economy* (pp. 63-67). Routledge.
Mariotti, I., Pacchi, C., & Di Vita, S. (2017). Co-working Spaces in Milan: Location Patterns and Urban Effects, *Journal of Urban Technology*, 24(3), 47–66.
Mariotti, I., Akhavan, M., & Rossi, F. (2021). The preferred location of coworking spaces in Italy: an empirical investigation in urban and peripheral areas. *European Planning Studies*, 1-23.
McGranahan, D. A., Wojan, T. R., & Lambert, D. M. (2010). The rural growth trifecta: outdoor amenities, creative class and entrepreneurial context. *Journal of Economic Geography*, 11(3), 529-557.
McLean, H. E. (2014). Cracks in the creative city: The contradictions of community arts practice. *International Journal of Urban and Regional Research*, 38(6), 2156-2173.
Menger, P. M. (2013). European cultural policies and the 'creative industries' turn. In *Handbook of research on creativity*. Edward Elgar Publishing.
Mitev, N., et al. (2019). Co-working Spaces, Collaborative Practices and Entrepreneurship. In *Collaboration in the Digital Age*, pp. 15-43. Springer, Cham.
Morisson, A. (2018, May). A typology of places in the knowledge economy: Towards the fourth place. In *International symposium on new metropolitan perspectives* (pp. 444-451). Springer, Cham.
Neffke, F., Henning, M., Boschma, R., Lundquist, K. J., & Olander, L. O. (2011). The dynamics of agglomeration externalities along the life cycle of industries. *Regional studies*, 45(1), 49-65.
Nilakant, V., Walker, B., van Heugen, K., Baird, R., & De Vries, H. (2014). Research note: Conceptualising adaptive resilience using grounded theory. *New Zealand Journal of Employment Relations*, 39(1), 79-86.
O'Connor, J., & Gu, X. (2014). Creative industry clusters in Shanghai: a success story?. *International journal of cultural policy*, 20(1), 1-20.
Pareja-Eastaway, M. (2016). Creative industries. *Journal of Evolutionary Studies in Business*, 1(1), 38-50.
Parrino, L. (2015). Coworking: Assessing the Role of Proximity in Knowledge Exchange. *Knowledge Management Research & Practice*, 13, 261–271.
Patton, M. Q. (2014). *Qualitative research and evaluation methods*. SAGE.
Parmentier, G., & Mangematin, V. (2014). Orchestrating innovation with user communities in the creative industries. *Technological forecasting and social change*, 83, 40-53.
Roberts, E., & Townsend, L. (2016). The contribution of the creative economy to the resilience of rural communities: exploring cultural and digital capital. *Sociologia Ruralis*, 56(2), 197-219.

Rowlands, H., B. (2005) Grounded in Practice: Using Interpretive Research to Build Theory. Electronic *Journal of Business Research Methods,* 3(1), 81-92.

Schmidt, S., & Brinks, V. (2017). Open creative labs: Spatial settings at the intersection of communities and organizations. *Creativity and Innovation Management*, 26(3), 291-299.

Stoneman, P. (2010). *Soft innovation: economics, product aesthetics, and the creative industries*. Oxford University Press.

Urquhart, C., Lehmann, H., & Myers, M. D. (2010). Putting the 'theory'back into grounded theory: guidelines for grounded theory studies in information systems. *Information systems journal*, 20(4), 357-381.

Vinodrai, T. (2015). Constructing the creative economy: Design, intermediaries and institutions in Toronto and Copenhagen. *Regional Studies*, 49(3), 418-432.

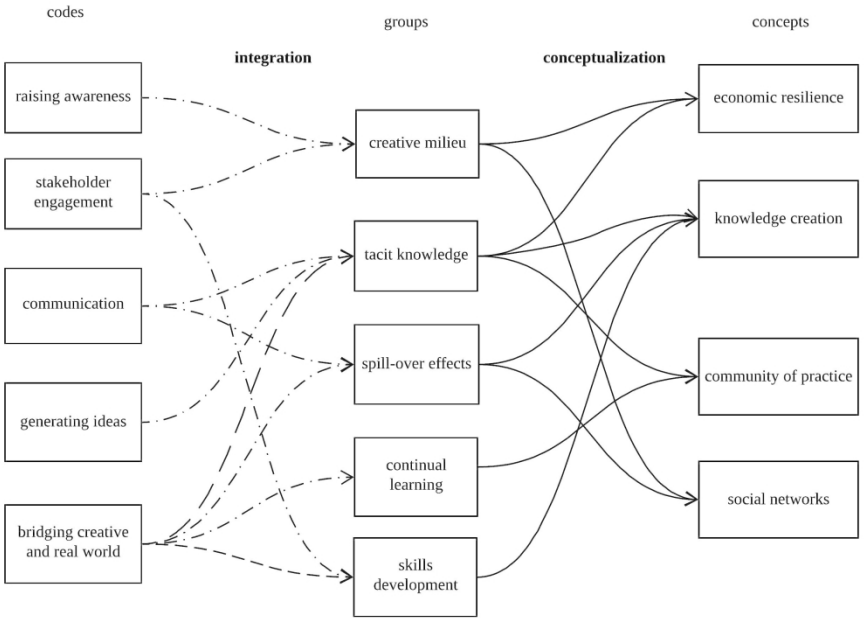

Figure 1. Data structure, integration, and conceptualization of collective learning in CWS
Source: Authors.

239x169mm (300 x 300 DPI)

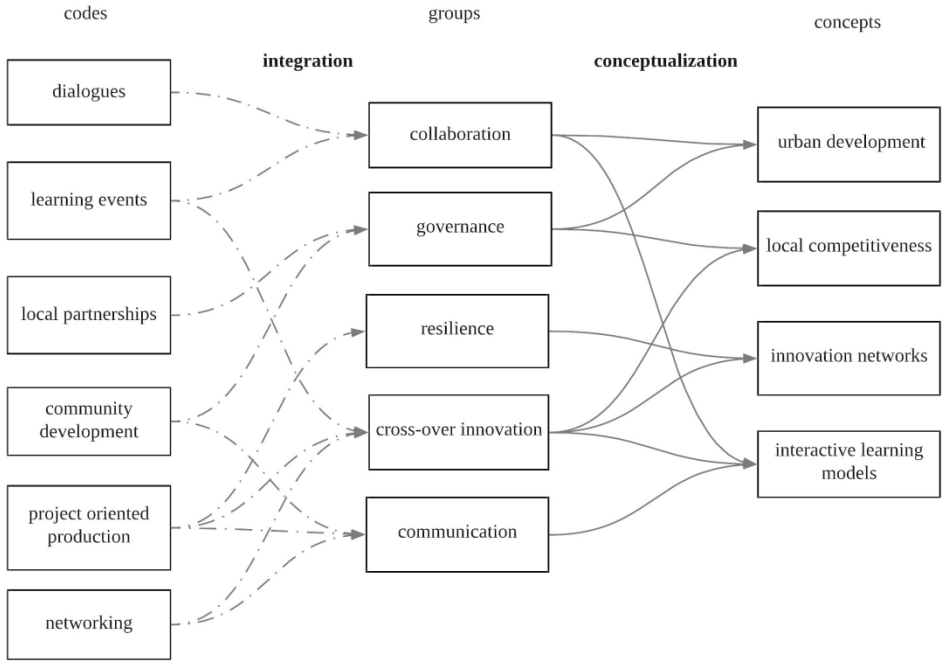

Figure 2. Data structure, integration, and conceptualization of knowledge sharing in CWS. Source: Authors

203x145mm (300 x 300 DPI)

Table 1: Data structure (groups and codes) and their integration to concepts - collective learning in CWS

Groups	Description (codes)	Integration to concepts
Strategic collaboration Learning platform	Creative-local communities	Community of practice (Blagoev, Costas & Kärreman, 2019
	Problem-solving skills	
	Entrepreneurial thinking/learning	Boosting entrepreneurship (Suire, 2018)
	Learning-based informal activities	
Cross-over innovation Project-based organization	Project-oriented production	Open innovation (Blackstone, Hage & McWilliams, 2016)
	Spillover effects	
	Local partnerships and trust	Adaptive resilience (Aldrich & Meyer, 2015)
	Interactive learning events	

Table 2: Data structure (groups and codes) and their integration to concepts - knowledge sharing in CWS

Groups	Description (codes)	Integration to concepts
Knowledge sharing Community-space	Linking stakeholders	Adaptive resilience (Aldrich & Meyer, 2015)
	Informal learning events	
	Systematic interaction	Retention /attraction of the CCI (McGranahan, Wojan & Lambert, 2010)
	Awareness of the CCI	
Skills development Interactive learning models	Stakeholder engagement	Community-based model (Blagoev, Costas & Kärreman, 2019
	Knowledge diffusion	
	Creativity and entrepreneurship	Knowledge base (Parrino, 2015)
	Bridging creative and real world	

Firstly, we would like to thank reviewers for insightful remarks and suggestions. We believe the input by both reviewers guided us to improve the quality of our empirical study.

Comments for the Author (Referee 1):

a) The introduction has improved; however, I think it is still necessary to try to identify the gaps and then present the motivation and purpose of the article in a less abrupt way as shown in the last paragraph of the introduction. In this part we should also talk about this article or in the first person in order to differentiate the contribution of the authors with respect to the other articles reviewed (line 43).In fact, the content of section 4 is what I would expect to find in the final part of the introduction.

Thank you for this valuable comment to clarify motivation and purpose in a more convenient way. Moreover, we tried to differentiate our contribution on both introduction and research gap with more precise use of the first person. We moved research problem setting in the end of introduction, as it was suggested.

b) Again and in line with the comments of other referees, I think the authors have made efforts to include references but in many cases, I think this problem has not been solved. For example, now we talk about buzz and face to face interaction with good references, but then the authors use them in a way that seems to explain the same phenomenon and this is not the case. This is also the case of the paragraph on the literature on creative industries lines 3-15 page 6. Where the authors cite important articles but without really explaining the results of this and their link to their article.

We understand the issue and we proceeded with more comprehensive manner in literature review part. More specifically, in cases that were mentioned – local buzz, face-to-face interaction, cultural and creative industries. All sections have been revised to remove redundant sentences/explanations and to avoid over-quoting.

c) I also think that the authors should refer to recent articles that analyze the two areas such as: Més informació sobre aquest text d'origenEs requereix el text d'origen per obtenir informació addicional sobre la traduccióText.

We appreciate this comment as it helped us to define research gap in a more complex way. We included suggested studies there were devoted to localization factors and prospects. Furthermore, we tried to include more recent studies in the literature review and research problem settings.

d) There are still many parts that are difficult to follow and understand the link to the purpose of the authors, such as the last paragraph on page 6

This comment

d) A minor comment, on line 28 of page 10 the authors use two verbs "suggest imply".

Fixed the typo.

e) In the results part, the section on Creative Ecosystem and collective learning, I do not see how the authors come to link with the economies of agglomeration, could be more explicit? The same thing holds for the link zith Jacobs economies in line 27 in page 13

Thank you for this specific comment, we explained agglomeration in a more explicit way – mainly in terms knowledge accumulation and sources like networking linkages. We discussed spillovers in terms of Jacobs economies in a section devoted to results.

f) I think that a summary of the results and implications is needed before the Discussion and Conclussion section

This is a valuable comment as we discussed moving this part in previous versions of the manuscript. We proceed to include summary and implication before the section devoted to a discussion to make it more comprehensive for potential readers.

Comments for the Author (Referee 2):

a) The paper is clear to me. There is still some little mistakes (in red in the attached file)

Thank you for highlighting the typos, some of them were overlooked – we corrected them.