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Being mobile: a call for collaborative innovation practices?

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Abstract

Purpose – The purpose of this study is to examine mobile technology as being a key apparatus and interface for collaborative innovation, which allows organisations to develop their information ecology.

Design/methodology/approach – The qualitative research was performed by in-depth interviews, observations and field notes. The eight main interviews are supported by an interdisciplinary narrative literature review of knowledge management and associated fields.

Findings – This study validates the following propositions: mobile technology can offer users timely information, mobile technology can foster collaboration beyond physical and organisational boundaries, in general, mobile technology enables a wider amount of interactions between people. Thereby, this paper draws some implications about the knowledge management of creative (and non-creative) workers.

Research limitations/implications – The collected data sheds light on how organisations and individuals positioned themselves about mobile technology co-creative practices before the COVID era. Therefore, it shall be pertinent to further investigate these findings through a quantitative approach to better ascertain path models and to strengthen the new results with another qualitative perspective, in the post-COVID era.

Practical implications – The study highlights how mobile devices are facilitating collaborative innovation practices by improving management decisions, enabling new business and/or operating models, developing a flow of ideas inner/outer an organisation and fostering the ability to make innovation.

Social implications – Mobile technology transforms the way to work (knowledge creation and/or conversion) and it changes the relations between collaborators in a working environment (beyond physical boundaries). This study deciphers how a creative and/or decision-making person can change their work schedule and/or routines based on the use of mobile devices.

Originality/value – The added value of this transdisciplinary study is that it improves research on collaborative innovation and collective knowledge by revealing three pertinent characteristics of mobile technology: enabling quick decision; connecting with a glocal network and fostering collective creativity. It also creates a bridge between the fields of education and business.

Keywords Collaboration, Organisation, Learning, Mobile technology, Innovation, Knowledge management, Community of practice (CoP), Collaborative innovation, Knowledge, Management

Paper type Research paper

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1. Introduction

"Globalisation has resulted in increased inter-firm networks" (Carayannis and Clark, 2011, p. 205) and "collective knowledge" (Pont, 2013; Levallet and Chan, 2019). Therefore, remaining "spectators" of the trends is no longer an option for any enterprise or socially-oriented business and their ability to quickly connect intangible resources could be of bigger importance than owning skills by 2030 (France Stratégie, 2017). Additionally, Anderson *et al.* (2001) define creativity as one of the skills more than necessary in the century of the knowledge economy. In this context, as technology ineluctably grows, the boundaries that separate stakeholders and organisations become blurrier (Gomes and de Oliveira Miranda Gomes, 2009), allowing for more flexibility and freedom and inciting more individualism and entrepreneurship, predominantly with millennials and GEN-Zers (Bhalla *et al.*, 2017). The relationships that are extended beyond the limits of the organisations are precious to attaining and disseminating knowledge and "knowledge is the impetuous for communication" (Carayannis and Clark, 2011, p. 203) to foster "social capital" and to thrive "cultural knowledge" (Levallet and Chan, 2019, p. 182). This situation is definitely a new challenge for management: understanding interdependence; catalysing local and global energies (Ollila and Yström, 2016), rather than trying to predict; control, invent and bring to life an organisation adapted to the needs of fluidity, cross-fertilisation and the production of creating wealth or knowledge value.

This exploratory study proposes to examine mobile technology (Jones and Marsden, 2006; Ahonen, 2011) as being a key apparatus and interface for collaborative innovation (Demil and Lecocq, 2012; Suire *et al.*, 2018), which allows organisations to develop their "information ecology" (Nardi, 1999) through a dynamic sense of what is inside and what is outside their boundaries. Said differently, our key intention is to explore and to define how mobile devices (smartphones, phablets or tablets) can enable co-creative practices notwithstanding formal structures and systems.

In the first section, we outline some relevant points from existing literature reviews with regard to creativity along with knowledge management and organisational knowledge dynamics. Within the inter-disciplinary narrative literature review (Baumeister and Leary, 1997), we also consider the nature and current needs of the environment for knowledge creation and/or conversion (Sawyer, 2008), as well as organisational "knowledge retention and/or knowledge loss" (Levallet and Chan, 2019) and highlight several technological enabling conditions (Makri, 2017; Levallet and Chan, 2018; Cheng *et al.*, 2019). In the second part, we introduce the methodological and qualitative approaches used for our analysis and findings, as well as their interpretations. We will then propose some avenues for further research. Finally, we conclude with our contribution to new practices in collaborative innovation with respect to mobile technology and possible directions for additional investigation.

2. Literature review

Our discussion starts with some purposeful excerpt of pertinent literature reviews with regard to the field of creativity and knowledge management (Gibbons *et al.*, 1994; Nag and Gioia, 2012; Levallet and Chan, 2018) and organisational knowledge dynamics (Amabile, 1997; Cohendet *et al.*, 2018; Glaser, 2017); new consideration for cognitive and social processes (Sawyer, 2005; Levallet and Chan, 2018; Presicce *et al.*, 2020); interactions and collaboration among people (Makri *et al.*, 2015; Slavich and Svejenova, 2016; Caniëls *et al.*, 2017) via technology in relation to collective and innovative practices (Demil and Lecocq, 2012; Suire *et al.*, 2018; Levallet and Chan, 2019).

2.1 Creativity and community of practice

Scholars identified various types of knowledge exchange and impediment (Paulin and Suneson, 2012; Makri, 2015), creation amidst several and eclectic modes (Nonaka *et al.*, 2000; Amin and Cohendet, 2004) and transfer mechanisms (Levallet and Chan, 2019; Hall *et al.*, 2020). In this inter-disciplinary examination, our focus is on knowledge *lato sensu* in Knowledge Intensive (KI) environments. In parallel, some researchers identified that another factor of success for organisations lies in the competencies of their local, national or international Communities of Practice (CoP) (Wenger, 1998; Nardi, 1999; Cohendet and Simon, 2008). By CoP, we refer to the seminal definition of Lave and Wenger (1991) which gives members, federated ad-hoc around some specific area of knowledge, a sense of joint enterprise and identity. It also involves developing a set of relationships over time and developing communities around things that matter to its members. The spur of the moment aspect can be critically important at a time of globalisation and international competitiveness (Martin-Niemi and Greatbanks, 2010; Makri *et al.*, 2015; Levallet and Chan, 2019). Mobile technology "enables the user to acquire, transfer and diffuse information and knowledge instantly, which creates value-added benefits for executives" (Carayannis and Clark, 2011, p. 232). Then, "the enabling context is composed of practices, situations and processes and offers learners opportunity to develop and apply deep understanding in the discipline" (Glazewski and Hmelo-Silver, 2019). Hence, we infer that:

P1. Mobile technology can afford users timely information.

Besides, to grasp how knowledge is managed within an organisational context other scholars (Allen and Cohen, 1969; Cecere and Ozman, 2014; Cheng *et al.*, 2019) adopted a network approach, which highlights the complexity of the possible connections beyond a specific environment, across the globe and through *collective knowledge* which "encompasses social capital (the intellectual capital embedded in relationships) and cultural knowledge (i.e. a broader view of how things are done in the organisation or whom to contact for a specific project question" (Levallet and Chan, 2019, p. 182). However, distinctive communities and actor networks also suggest that the powers of context – spatial and temporal – should be placed at the centre of any theorisation of knowledge formation (Bratianu, 2010). Essentially, the network and its implied interactions bring to light a "complex maze of creativity" (Cohendet and Simon, 2008, p. 5). Therefore, it is important to explain further the ad-hoc constitution of networks and/or CoPs mainly composed of individuals, groups or teams, in specific locations for a certain time.

Therefore, we propose to zoom into the structure of a group/team and its influence, in relation to some collaborative innovation (Demil and Lecocq, 2012) and "collective knowledge" (Levallet and Chan, 2019) principles to better under the theoretical and practical implications of some networks and/or CoPs. Based on Anderson *et al.* (2001) findings, Slavich and Svejenova (2016) identified the following factors which influence innovative practices and creativity: "team structure (task and goal interdependence) and composition (diversity), as well as of team climate (i.e. participative) and processes (information exchange, problem-solving and conflict management)" (p. 238). Furthermore, Carayannis and Clark (2011), who referenced Foster and Ford (2003), advanced that leaders, decision-makers, "need to tap into other's hidden knowledge through connection building (networks), creativity and discovery" (p. 229). Moreover, in line with Makri *et al.* (2017), who defined value creation as a result of encountered information because of technology and its ability to enhance and capture information experiences, Levallet and Chan (2018) further advanced that organisational structure, culture and performance can be enhanced by digital capabilities. Additionally, Cheng

et al. (2019) defined that some "computer-supported collaborative learning" tools can enable inter mutual problem-solving "without the restriction of time and place" (p. 489). Corollary, we conjecture the following:

P2. Mobile technology can foster collaboration beyond physical and organisational boundaries.

Ergo, we discern that there is a pattern focussing on diversity, whereas in actors' profile, in ways of exchanging information or sharing knowledge (Cochrane, 2010; Hall *et al.*, 2020). Moreover, one of our recurrent findings within the inter-disciplinary literature refers to Tuckman's (1965) model and the importance of having diversity among collaborators, as well as a "space to breath", which can be reinforced by an "organic rather than mechanistic" structure via "an interaction between individual and work situation at different organisational levels" (Woodman *et al.*, 1993, p. 302) to increase the chances to attain relevant and/or pertinent creative outcomes (Presicce *et al.*, 2020). While, Ford (1996) identified new emerging approaches on organisational creativity through "sensemaking processes, motivation, knowledge and skills", Nardi (1999) singled out "collective participation in shared and value activities" to find a balance in motion within a "healthy ecology of information". Anderson *et al.* (2001) conceived creativity and innovation as part of an overall equivalent operation, which resulted in connecting them concurrently. Hence, on the one hand, collaborative innovation requires managing the socially distributed knowledge amid a borderless territory (Nardi, 1999), involving greater multidisciplinary collaboration and problem-oriented and consequently the co-creation of knowledge production (Gibbons *et al.*, 1994; Huizingh, 2011). On the other hand, DeFilippi *et al.* (2004) claimed that many organisations are trying to solve the predicament between creativity and efficiency by separating the creative work units from the routine ones. Additionally, Alter (2000, p. 367) defined organisation as being the result of standardising, planning, scheduling, coordinating, which consists in reducing uncertainty while innovation means exactly the opposite. The paradoxical notion of the logic of innovation is in contrast to those who support the organisational status quo or rationalisation and it is even more problematic if we look at economic factors such as the level of fixed cost (Teece, 2018).

2.2 Creativity and mobile technology

Beyond networks and teams, within this constant flow of information and interactions, Botha *et al.* (2009) claimed that "mobiles activate the notion of the prosumer, which consists in the synchronicity of producing and consuming content or culture". It also expands to intercultural competencies and communication skills, which benefit from the use of mobile phones, as a mediator in their development (Cochrane, 2010; Hall *et al.*, 2020). Thus, socialisation through mobile technology is possible and pertinent and can happen beyond geographical location and time constraints (Cochrane, 2010; Cochrane and Antonczak, 2013 and 2015a). Besides Hamel and Zanini (2014) advocated that easy and effective collaboration on a larger scale is one of the key advantages of mobile technology. For them, mobile technology can spur specific qualities such as real-time, socially constructed approach to learning, change and co-creation (Roser, *et al.*, 2009; Cochrane *et al.*, 2014). Furthermore, inside the various stages of the development of a project, information technology plays an important role as a mediator, a facilitator (Fruchter, 2001), gathering people towards the same mindset and the same willingness to engage with productive learning activities (Cochrane and Antonczak, 2015b) and per learning (Presicce *et al.*, 2020). Mobile technology "may simply help liberate and unleash the creative genius of individuals and teams by enabling a virtual 'omni-presence' and collaborative innovation commons" (Carayannis and

Clark, 2011, 202). Withal, Kane *et al.* (2011) identified four affordances whereby social media support intellectual capital creation. These four affordances represent different ways to engage in collective and open knowledge conversations: metavoicing (affordances, less hierarchy), triggered attending (immediacy, notifications), network-informed associating (pervasivity, metadata) and generative role-taking (authenticity, less influence about position/title status). Makri *et al.* (2015) findings about serendipity in relation to information encounters confirmed some of the cited affordances. More recently, Nikolić and Natek (2018) characterised these enhancements as major opportunities to cross-pollination ideas in spite of some *modus operandi* challenges, especially in terms of synchronous and/or asynchronous coordination towards a deadline. In conjunction, Anders (2016) characterised a preference for flexible variability and dynamic scaling of communication synchronicity – the degree to which communication behaviour is shared and coordinated. Anders called it "polysynchronicity" (p. 257). This last point steers to the third supposition:

P3. Generally, mobile technology enables a wider amount of cognitive interactions between people.

Thus, referring back to the research question "how can mobile technology enable co-creative practices notwithstanding formal structures and systems"? And our propositions (*P1*, *P2*, *P3*), the presented literature review suggests that mobile devices allow new ways to organise knowledge, to work and to recreate linkages, vertical and/or horizontal partnerships (Ollila and Yström, 2016) and to be able to engage with new learnings at every level through either a network, either a CoP, a group or a team. Exchange among peers, colleagues and/or experts enriches organisational conditions (Pont, 2013; Presicce *et al.*, 2020) because of shared experiences and swift information exchanges (Hall *et al.*, 2020). Using "a facilitating tool in both formal and informal learning environments" (Carayannis and Clark, 2011), namely, mobile technology, can result in a dilemma: "coupling or decoupling creative and routine work" (Cohendet and Simon, 2008, p. 5). Although routine scholars have highlighted the importance of outcomes in routine dynamics, Alter (2000) claimed that the central tension between innovation and organisation is precisely on this matter: "routine, repetition, landmarks, heritage – all these things allow access to identity and socialisation. However, the movement destroys these things" (p. 374). By movement, we need to understand networks and/or CoPs' internal/external cognitive interactions. Consequently, according to the original "Unfreeze – Change – Refreeze" (Lewin, 1947) in relation to firms' strategic changes (Kotter, 1996) and some of its "messiness" (Ollila and Yström, 2016), we conjecture that mobile technology currently increases and reinforces the notion of "permanent slush" and it supports individual and group learning scaffolding (Cochrane *et al.*, 2014; Glazewski and Hmelo-Silver, 2019). Aligned with Sawyer's (2005) seminal definition of learning sciences, Carayannis *et al.* (2013) summarised similar findings by: "mobile technologies (. . .) have the potential to change the way business executives communicate, interact, learn and behave" (p. 444).

The following section concentrates on a qualitative approach, made of eight narratives, their synthesis and their interpretation and some further avenues for additional or complementary, research.

3. Narratives

While there is an extensive body of publications focussing on the practical and utilitarian aspect of mobile technology such as ergonomics, user interface, user experience and applications development (Jones and Marsden, 2006; Ahonen, 2011), this transdisciplinary and exploratory research focusses on the relationships which can exist between workers and

organisations. More precisely, this qualitative case study focal point is to develop an analytical explanation of the role of mobile technology in "collective knowledge" creation (Levallet and Chan, 2019), a co-creative organisational process. Thus, the preliminary empirical findings detailed in the eight narratives provide grounded support for an initial theoretical framework that explains how mobile technology can enable collaboration and creativity by unveiling some weak signals. To wit, the qualitative methodology undertaken in this study is supported by an interdisciplinary literature review analysis, a series of narratives via Talanoa's approach (Antonczak, 2020) and, in terms of connecting concepts in a transdisciplinary theoretical framework, we also use an *Enhance Grounded Theory Development* (Gioia *et al.*, 2013, Appendix A) coupled with an inducting process model. The various open conversations with the participants aimed at bringing to light some weak signals such as unconscious patterns, latent routines or subconscious behaviours. Also, Carayannis and Clark (2011) defined that this kind of exploratory and qualitative approach based on testimonials from mobile users is appropriate to meet with "the desire for between understandings" (p. 204).

3.1 Syllabus

Over an 18-month period, we carried out eight conversations involving eight informants across two different countries (Aotearoa/New Zealand, France). Table 1 provides a breakdown of the informant's profiles (byname, status), their organisations (sector, company size) and the way the conversation took place (mode). All data have been collected shortly before the Corona (COVID-19) outbreak.

Noteworthy, all companies are involved with a substantial amount of creative activities and endeavours (from ideation to implementation), half of the represented companies are SMEs and all the informants acknowledged dealing with a fair amount of responsibilities and autonomy in terms of decision-making and creativity. Finally, even if some companies provided some informants with a smartphone and/or a tablet, all of them are using their personal device(s) for work purposes either occasionally or regularly. The first series of conversations happened with four participants (Aotearoa/New Zealand, synthesised and titled as "NZ" in Figure 1), then 6 months later with three more participants (France, summarised as "FR" in Figure 1). In addition, we organised one more conversation one year later, with one participant (Aotearoa/New Zealand) who has a good practice across most of the delineated sectors. While collecting the data and strengthening the trustworthiness of the testimonials, we prompted our informants to share detailed examples to illustrate their commentary about the role of mobile technology and its use, especially with the latest contributor who provided more in-depth information in relation to our early findings. Because we started the first set of face-to-face interviews in Aotearoa/New Zealand, we opted for the use of a Talanoa method. Talanoa is "a personal encounter where people story their issues, their realities and aspirations" (Vaioleti, 1999–2002), similarly, Gioia *et al.* (2013) claimed that "If we had designed our interview protocol around existing theory and terminology, we would have missed a key aspect of their sensemaking by imposing our preordained understandings on their experience" (p. 17). Based on Vaioleti (2006), we also used the three key stages and principles of Talanoa, namely: *Toli*, *Tui* and *Luva* (Figure 1). As portrayed by Vaioleti, *Toli* "involves deciding on, selecting the participants" (p. 27) to start the collection then the analysis of the data; *Tui* consists of making sense of "authenticity, relevance and usefulness of the research" which "dependent on the type and amount of information used, how data are arranged in relation to one another and how they are presented as research" (p. 27); then *Luva* occurs "when the research is given for the benefit of the community" (p. 27), in our case: sharing back with the participants any results

	[INFORMANTS]	[SECTOR]	[COMPANY SIZE]*	[STATUS]	[MODE]
Aotearoa/New Zealand	A	Telecommunication	<10,000 staff	Manager	Site/café
	H	Creative writing	SME	Self-employed	Off-site
	M	Hospitality	SME	Manager	Site/café
	T	Education	<10,000 staff	Manager	Site
	V	Education	<10,000 staff	Manager	Site
France	C	Webdesign	SME	Self-employed	Videoconference
	L	Event management	SME	Self-employed	Off-site
	N	Contemporary arts	<10,000 staff	Employee	Site

Note: *A small and medium-sized enterprise (SME) is composed of less than 250 employees (definition of the European Commission)

Table 1.
Informants and companies details

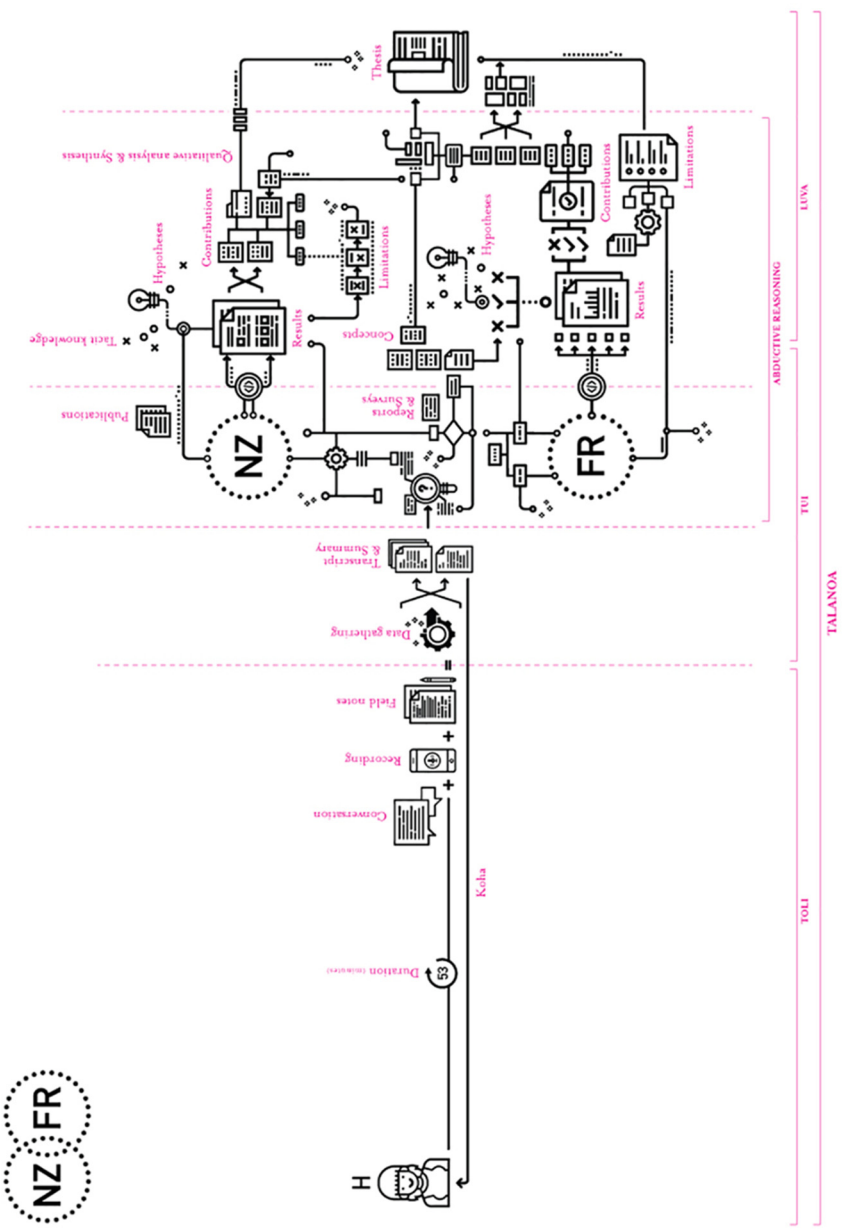
and/or publications. Overall, Talanoa is analogous to grounded theory, which is often used when investigating new theories instead of methodically continuing existing ones (Fernández *et al.*, 2002), when the research objects are located in the compass of a technical-organizational-sociological-ethnographical enquiry and "to capture the essence of these sticky inter-relations" (Dougherty, 2017, p. 849). However, Talanoa is built on inclusiveness, participatory (co-creation) and transparent exchanges through the process of empathy, sharing ideas, know-how and experiences. Because of Talanoa, we were able to engage in conversations by respectfully and timely sharing knowledge (tacit or explicit) and opinions (belief, propositions or hypotheses). Straightforwardly, Talanoa implies engagement and learnings from both parties – the participant and the researcher. Therefore, in this study, Talanoa is a more relevant approach to ascertain weak signals and to advance mutual knowledge via exchanged storytelling and cultural respect as it takes the form of a discussion between two experts rather than taking a neutral position for the observer.

3.2 Methodological approaches

During the interviews, we took thorough notes in parallel to the recordings (*Toli* – Figure 1). After each conversation, we synthesised the detailed field notes and quickly shared the audio-recording, its transcript and the synthesis with the informants (*Tui* – Figure 1). By following this rigorous process, we familiarised ourselves with some specific participants' work terminology and *modus operandi*, as well as with their creative mindset/process. Also, the supporting industry-related information originated from a merger of multiple articles, surveys and reports, which were synthesised by professionals and/or experts (CRÉDOC, Deloitte, McKinsey and Company and the like), as well as non-profit organisations: World Economic Forum (WEF); National Endowment for Science, Technology and the Arts (NESTA); Research Network on Innovation (RNI) to name a few. Moreover, Figure 1 synthesises and visualises the investigation which is based on Bonoma's (1985) five-phase scheme such as description (*Tui*), classification (*Tui*), measurement/estimation (*Toli*), establishing of association (*Toli*) and determining cause and effect (*Toli*). While unveiling weak signals (Schoemaker and Day, 2009), we also adopted Nag and Gioia (2012) a "'sense-making' (meaning-making) and 'sense giving (providing meaning for others)" (p. 424) stance. Following the approach of Nag and Gioia (2012), we also "started discerning linkages among the categories that could lead to the development of second-order themes (theoretically distinctive, researcher-induced concepts, formulated at a more abstract level, albeit with an attempt to apply informant labels if those labels represented theoretical concepts)" (p. 427). Unitedly, we encountered every recording several times to discern resemblances and/or discrepancies among participants. As a result, over time, we ascertained data that were akin, forming some early concept patterns, which we organised into "first-order categories" (Nag and Gioia, 2012) by keeping the informants direct words when workable. Figure 2 shows the synthesis of the induction of the second-order (themes) and its refinement into an aggregation of attributes or *dimensions* as denominated by Nag and Gioia (2012) or Gioia *et al.* (2013). This meticulous methodological procedure enabled us to reveal some weak signals from the data and to establish more clearly the foundation of the distinctive *concepts*. We outline that, during the data analytical phase, we also kept peculiar alertness on any possible correlation or interdependence between the emerging concepts, which contributed to consolidate the inductive model accordingly.

3.3 Background of the data and results

As we revealed some indistinct working features and concealed behaviour, we collated them into *concepts* (first-order categories), using language used by the informants whenever



Source: adapted from Antonczak (2019)

Figure 1.
Visualisation of the research design

possible. Also, by combining the *themes* (second-order categories) and *attributes* (aggregation) displayed in Figure 2 (a concise overview of the data collection) and by consolidating the new findings with an additional narrative afterwards (one year later), we verified that the first analysis was consistent with the post hoc assessment and synthesis.

Figure 2.
From *Concepts* to *Attributes*, based on Nag and Gioia (2012)'s approach. For readability purposes and due to the word limitation, only up to 5 representative quotes for each first-order category are displayed; please contact the author if you require further examples

To sum up, Table 2 visualises the *attributes* and their direct relation with each testimonial/informant during the first and second stages of the research. The empirical findings detailed in the following narratives provide grounded support for a theoretical framework (*Luva* – Figure 2) that explains how collective knowledge and innovative practices can benefit from mobile technology. Hence, seven core concepts with theoretical significance arose such as *Quick-decision-making*, *Easiness*, *Authenticity*, *Glocal Network*, *Collective innovation* or even *Etiquette* and *Privacy*. Furthermore, supported by a back-and-forth process between the inter-disciplinary literature review and the data analysis, we followed an "inductive concept development" (Gioia *et al.*, 2013) to unveil four patterned advantages related to collaboration through mobile technology, which we denominated as *m-collaboration* (Table 2), namely – *immediacy*, *ubiquity*, *interactivity* and *accessibility* in information/contextuality. We also brought to light three key associated limitations (Table 2) – *addiction*, *infobesity* (information obesity) and *being connected 24/7*.

Our data analysis was conducted through an inductive/abductive process (Tui and Luva – Figure 1), which enabled the generation of emergent theoretical concepts and their correlation. In general, some of the key mobile (smartphones and associated) benefits defined by Ahonen (2011) arose through the analysis and interpretation of the data. According to Ahonen, there are nine distinctive advantages of mobile and this investigation relates to six of them: mobile is the "First Personal Mass Media, Always Connected, Always Carried, Available at Creative Impulse, Enables Augmented Reality (in our case: geolocalisation) and Offers Digital Interface". Indeed, our research because of the new defined patterns, suggests a new perspective on collaborative innovation (Demil and Lecocq, 2012; Suire *et al.*, 2018) and "collective knowledge" (Levallet and Chan, 2019; Cheng *et al.*, 2019). Some of the attributes such as "immediacy" relate to participants appreciating the unlimited temporal environment in which they could engage with others (Cochrane and Antonczak, 2013) and exchange knowledge (Suire *et al.*, 2018, p. 72):

> "I make songs. So in fact, when I go for a walk or a run in the woods and have some inspirations, I start singing either melodies or lyrics (which I record because of my phone) [. . .] otherwise, I forgot when I got home" (Participant N).

Then "ubiquity"- mobile devices supports contributors connectivity in spite of the diversity and multeity of their surroundings (Miles *et al.*, 2005; Cochrane, 2010). Also, the vast majority of the participants shared that they have a sense of spatial freedom in relation to

	Aotearoa/New Zealand				France		
[PARTICIPANTS]	T	V	M	A	L	C	N
[m-COLLABORATION]							
[ATTRIBUTES]							
IMMEDIACY	+	+	+	+	+	+	+
UBIQUITY	+	+	+	+	+	+	
INTERACTIVITY	+	+	+	+	+	+	+
CONTEXTUALITY	+	+		+	+		+/−
[LIMITATIONS]							
ADDICTION		−			−	−	−
INFOBESITY	−		−			−	
HYPERCONNECTIVITY	−	−	−	−	−	−	−

Table 2. Synthesis of the empirical findings in conjunction with the *literature review*

their online engagements or e-social life because of their smartphones which are always in their hands or in their pockets:

> "It's the same simple fact that when I'm on the move, on public transport it allows me to continue to monitor my emails and respond to them (. . .) The advantage of receiving a notification of a message for me is to see that your contact is online and to be able to answer him immediately without it being by chance because you opened the application in the evening" (Participant C).

And "interactivity"- mobile technology enables direct or indirect, communication with others for all the participants. Most of the time, the exchange of information happens in a casual and authentic way synchronously (immediacy), asynchronously (ubiquity) and/or even in a "polysynchronicity" manner (Anders, 2016, p. 257):

> "And after the other advantage all this is to keep an eye on [. . .] on our digital existence [. . .] on our work environment or on our emails, on the moment [. . .] but always in a consultation way with yeah [. . .] with interactions that are fast and light" (Participant C).

> "The conversation is different on mobile, it's more fluid [. . .]" (Participant A).

Finally "contextuality"- because of some of the mobiles devices features (GPS, accelerometer, for instance), participants can either better record some of their experience or "trigger their memory" (Participant V and A) by using rich media (video, images and audio, text) and its meta-data associated (Cochrane, 2010; Ahonen, 2011). Yet, a mobile device can provide a better experience in relation to its interface and contextual usage (screen resolution and format, absence of "third party" such as a keyboard and/or mouse, for example):

> "You're geotagging photos, videos, using Twitter on the go and once again when you're tweeting getting your location as part of that. So it's proof that you're actually somewhere that you say you were, doing a meeting, etc (. . .) so that's the way that I provide a trail of proof of my work activity to my boss because he follows me on Twitter. Because I'm so often in the office" (Participant T).

> "Yes, but let's say that on the computer I have the two parts of the body that I need, the eyes and fingers are in the same place [. . .] not, finally on a mobile phone. I don't know how to explain it better but in any case, the experience [. . .] the tactile dimension makes me have one of my senses solicited in addition. Therefore, the experience is more complete (on a mobile)" (Participant L).

To sum up, this section roughly uncovered four advantages and three limitations, which explain how mobile technology can contribute to collective and innovative knowledge practices, which we identified as *m-collaboration* (Table 2). The next section will further detail these transdisciplinary and exploratory empirical findings.

4. Discussion/analysis

Overall, we were able to identify some of the patterns and mechanisms on which some attributes and limitations are established (Table 2) and we ascertained unequivocal patterns of variation in how mobile technology can enable organisational work through formal and informal *m-collaboration*. Based on this qualitatively rigorous inductive approach, the following section will address these categories and properties in relation to collaborative and innovative practices in three insights in minutia: enabling quick decision-making, connecting with a *glocal* network and fostering collective innovation.

4.1 Enabling quick decision-making

Unanimously, participants appreciate the spatiotemporal facility that mobile technology can provide and the following is an excerpt of one of the narratives:

> "Yeah so I can be in one meeting and quickly respond to another thing and not block the developer" (Participant A).

Another finding concerns the optimisation of the interviewee's commute, some of which can go beyond the hour. Before they even reach their workplace they can start organising their work priorities, even answer some emails or requests. In other words, mobile devices can empower them to "keep track of people's activity, of what they're doing [. . .]" because "it's always on and almost always in my hand" (Participant L) which can be crucial in some business situations such as encapsulated in this extract from another narrative:

> "All of those things: time management, organisation, but the biggest thing of all of this [. . .] in a time we get bombarded with information in real-time, with multiple devices, it makes it very immediate. So I may know something's going on, somewhere in my day or when you get this [. . .] to come through. So, it makes it immediate. So, I know. And then, I can make a decision when I come out of the meeting either dealing with that, on it's on the back burner for later in the day" (Participant M).

Moreover, all interviewees felt emancipated by mobile devices because of the ability to geolocate information, which adds a sense of authenticity (Participants C, L, T and V). In some cases, the bona fide recorded or shared, information/knowledge associated with metadata such as GPS coordinates can play an important role in making "strong ties" and supporting cooperative and risk-taking behaviour (Cecere and Ozman, 2014, p. 164). In other words, mobile devices can improve the efficiency of formal or informal, cooperative learning experiences (Cochrane and Antonczak, 2015a) and consolidate the trust within collaborative practices (Askay and Spivack, 2010) and "social process" (Presicce *et al.*, 2020, p. 696), even if it is via establishing a "swift trust" (Panahi *et al.*, 2012) through genuine and honest or serendipitous (Makri *et al.*, 2015), interactions.

Beyond some authenticity related to the geolocalisation transpires another enabling factor for making swift managing decisions or calls for actions, which consists of "memory triggering". Indeed, mobile technology can provide valued support by recording an idea, a thought, a conversation, an interaction within a specific environment and/or time. It is easily ready when users or collaborators, need it while a laptop has a bigger chance to be either stored safely in a bag, either left on the desk in the office or simply switched off. A conversation with Participant A exemplified this acumen:

> "The photos are important to me cuz I had to do timesheets, sometimes. I'll actually go to look at my photos and check what was I was doing to know what was going on and also if I can't if I think back to when did I do that workshop I can go here and then find all the notes".

In a nutshell, the above outcomes substantiate propositions *P1* and *P2* and the deduction that mobile technology can improve decision-making via spontaneous and/or immediate ways of recording, sharing and exchanging knowledge across time, space and surroundings. Some scholars such Carayannis and Clark (2011) have suggested that "this technology enables the user to acquire, transfer and diffuse information and knowledge instantly, which creates value-added benefits for executives" (p. 232). This breakthrough enriches that view.

4.2 Connecting with a glocal network

> "People I follow in their ideas fuel my head in my ideas and that's the way I've set up my network. (. . .) I think I have about 600, not a lot [. . .] all around the world" (Participant V).

The choice of the environment in relation to specific knowledge, within a defined period, can be crucial (Nardi, 1999). It can enhance the creation of new businesses/initiatives because of newly, conscious or serendipitous (Marki *et al.*, 2015), discovered knowledge-based approaches, new collaboration modes (Ollila and Yström, 2016; Antonczak *et al.*, 2016). This is particularly important at a time of multinational and/or international development when teams are deployed across the globe according to specific expertise and/or competencies, as expressed through the following:

> "It's 'cause a lot of the communities I work with are global and so they can be at any time of the day because, you know, they're on a different time zone. So, it's where mobile devices are very useful as being able to bridge time zones" (Participant T).

However, unlike Nardi (1999), who emphasised human activities above technology, Evans (2016) declared that "mobile is an ecosystem, not a screen size" and he defined the new ecosystem as being more pervasive than any traditional one due to the scale of its ubiquitous connectivity and sensors. Thus, relating to Bathelt and Turi (2011), we side with the potentiality of new technologies to change communication patterns and the nature of knowledge generation. For instance, in management research, Edvinsson (2018) questions new operational modes by connecting "dots in a galaxy of options for value creation" (p. 61) and in learning sciences, Pont (2013) claims that technology is conducive to generate organisational conditions which contribute to improving schools organisations standards (p. 55). Hence, social and human practices are merging to become one, instead of being considered as a "recursive continuum of mind-body-object practices in specific organisational settings" (Bennis and Biederman, 1997). One clear indication of our findings is that knowledge is not fixed to a particular site (sector, geographical locations or network) and that mobile devices are fostering the move across various learning practices and actors, which increase the potential for innovative initiatives to emerge and cognitive and social interaction to occur more often (Shapin, 1995; Sawyer, 2008; Hall *et al.*, 2020). Volkoff and Strong (2013) further defined that the "innovation mechanism starts with a 'space of possibilities' that arises from the infrastructure architecture and operations and enables the emergence of ideas for new services" (p. 822):

> "So, from being open, we changed our lives to being closed inside a space. I think now mobile devices are actually taking us back to the start of [. . .] (human evolution) because it allows us to be open again but also have the affordances of new technology, which our ancestors didn't" (Participant V).

However, Cecere and Ozman (2014) identified that, although versatile interactions among collaborators can increase the performance of a network, too many of them can be detrimental. While Carayannis *et al.* (2013) determined that "if managed efficiently, these entrepreneurial networks can present unique opportunities for leaders to learn from one another, creating expanded products and services, vision and the ability to explore" (p. 447). Furthermore, due to our findings with regard to "hyperconnectivity" and "infobesity", we propose to slightly adjust our focus on the notion of openness and affordances offered by mobile technology (Makri *et al.*, 2017). As such, transcending networks, communities, geographical boundaries and the myriad of interactions between people contribute to the "hidden architecture of creativity" (Cohendet and Simon, 2008) by breaking with traditional forms of pedagogical management (Pont, 2013; Cochrane and Antonczak, 2013; Glazewski and Hmelo-Silver, 2019) and innovation management (Ollila and Yström, 2016) that favour forms of organisational continuity, rather than human continuity.

To sum up, mobile technology ubiquitousness can enable new ways of dealing with cognitive and social processes (Sawyer, 2005; Cochrane and Antonczak, 2013; Presicce *et al.*,

2020) with a specific emphasis on human-centred interactions, independently of their physical settings if/when needed; and "entrepreneurs who leverage mobile technologies tend to increase their chances in the generation of additional resources" (Carayannis *et al.*, 2013, p. 470). This particular discovery corroborates *P2*.

4.3 Fostering collective knowledge and innovative practices

Mobile technology can increase the interactions among collaborators, communities or networks by making the sharing of ideas, the recording of quick notes easier despite professional titles, positions or ranks or being in a different spatiotemporal environment (Participants L, N, T and V; Cochrane and Antonczak, 2013; Antonczak *et al.*, 2016). Even if mobiles' screens can be a limitation, especially for long documents, for example, it offers another informal space enclosed by a location, a *ba* –a frame "made up of the borders of space and time" (Nonaka and Konno, 1998). Thus, an idea can then be easily shared concisely, even "abruptly" (Participant M) in that *ba mobile* (Antonczak, 2019) such explained in this narrative excerpt:

> "When you are on the phone, my responses are abrupt, you know, short, to the point. It says 'sent from an iPhone', always at the bottom of the message. So, because quite often, I don't say 'dear', I just answer whereas with an email, I will always give salutations and thank you at the end or whatever" (Participant M).

Hereby, it enhances the potential for innovative practices, maintaining collaborative processes (Crosby and Bryson, 2010; Levallet and Chan, 2019) and co-creating solutions (Neghina *et al.*, 2015; Cochrane *et al.*, 2016) by providing an environment without so much distinction about "social baggage" (Bathelt and Turi, 2011) or by preserving anonymity (Martin-Niemi and Greatbank, 2010) in some cases. This specification echoes with the fact that the participants reported that they experienced an increase in reach and access (Antonczak *et al.*, 2016; Cheng *et al.*, 2019). This shift afforded them the opportunity to increase investment activities, innovate and effectively produce with less effort (Carayannis *et al.*, 2013, p. 470) and "seizing opportunities" when they come to light (Marki *et al.*, 2017, p. 3). In other respects, mobile technology can serve a very specific community of experts, dispatched across the world, through live or asynchronous interactions and/or notifications which can sometimes help collaborators to stay vigilant about "vital" pieces of information (Participant M). It facilitates inclusive connections and collective decisions of priorities, time management and processing information on the go (Anders, 2016; Levallet and Chan, 2018; Hall *et al.*, 2020) at a swift fingertip within friendly adaptability, modularity and agility coworking (Morel *et al.*, 2018) headspace in spite of potential concerns with regard to "addiction". Beyond Levallet and Chan's (2019) definition of the knowledge transfer mechanism, Mercier-Laurent (2015) talks about the "innovation biosphere" when discussing the attributes of the digital ecosystem dealing with explicit and tacit patterns of knowledge. However, it can generate "information obesity" or "'hijack' people's minds" (Carayannis and Clark, 2011), which could have some effects on efficiency (Cecere and Ozman, 2014), contribute to "knowledge loss" (Levallet and Chan, 2019) or even labour productivity and revenue growth (Aral *et al.*, 2007) in the case of businesses. The process of curation of information, of new knowledge, could sometimes even become tricky (Participants M and C; Marki *et al.*, 2017; Levallet and Chan, 2019). Nevertheless, mobile technology challenges the routines' performance (Glaser, 2017) by supporting the logic of innovation, in contrast to the "organisational *status quo* or rationalisation" (Alter, 2000, p. 98):

> "I don't think we share enough, that individuals don't share enough. So, we, as individuals, keep making the same mistake, you probably have made" (Participant V).

So, self-and/or others development, communication, values (Pont, 2013) and productivity across or not, organisational boundaries can be facilitated via instant messaging or video calls (Bathelt and Turi, 2011), for instance, and less formal cognitive interactions by virtue of mobile technology. Overall, mobile devices are excellent tools for instant communication, for archiving and retrieving interactions or processes, for involving multiple actors across eclectic locations and, sometimes, various time zones (Cheng *et al.*, 2019), although they require a specific set of skills in terms of Spatio-temporal management (Majchrzak *et al.*, 2013) or improvisation (Levallet and Chan, 2019).

To recap, notwithstanding the validation of *P1* and *P2*, this specific argument propounds *P3*: mobile technology can foster a flow of ideas/information/knowledge inner/outer an organisation with a fair sense of collegiality and authenticity (Hall *et al.*, 2020), "it can support new ways of thinking about learning" (Sawyer, 2005, p. 1) "ultimately resulting in incremental efficiency gains" (Carayannis *et al.*, 2013, p. 468).

Conclusively, this section determined how mobile technology can enable quick decision-making, facilitate connection with a glocal network and foster collective knowledge and innovative practices. Therefore, it provides a new and preliminary transdisciplinary theoretical ground for collaborative learnings and innovative practices in relation to technology.

5. Conclusion

> "The farmer cannot make the germ develop and sprout from the seed; he can only supply the nurturing conditions which will permit the seed to develop its own potentialities. So it is with creativity" (Rogers, 1954, p. 256).

Throughout the inter-disciplinary narrative literature review and the case study presented, our findings suggest that mobile technology can enable collaborative and innovative learning practices by fostering atemporal and dynamic interactions beyond the boundaries of a specific environment. The concept of "ATAWAD" (Any Time Any Where Any Device) aroused from the narratives and some of the interviewees particularly appreciated the ability to work in more relevant surroundings to enhance their creativity such as cafés or parks (Cohendet *et al.*, 2018; Morel *et al.*, 2018), which allows them to change their perspective, to get into another headspace, to feel more inspired or relaxed. More specifically, mobile technology enables quick decision-making in spite of users' locations, it enhances creativity by allowing people to work, to share, to learn, from any surroundings or settings across eclectic spatiotemporal zones, consequently it thrives on knowledgeable and contextual collaboration practices. Furthermore, mobile technology "affords user unlimited access to the Internet" (Carayannis *et al.*, 2013, p. 445) and easily provides users to receive or to deliver formal or informal information to others (Levallet and Chan, 2018). Consequently, over time the nimble information resourcefulness provided by the affordance of mobile technology may induce users' decisiveness, inventiveness, newness and productiveness (Carayannis *et al.*, 2013), enable serendipitous competency (acquiring skills) (Makri *et al.*, 2019) and solve familiar and unfamiliar problems (Wodtke, 2017), therefore inducing valuable asset for leaders or companies.

Thus, this transdisciplinary paper makes three contributions to learning sciences, management and organisational research. The first one is about expanding and connecting the literature to and from, other territories. Supported by a qualitative in-depth analysis of conversations, coupled with content analytical procedures (concepts, themes and attributes), this paper takes a fine-grained approach to mobile technology and its implication in knowledge creation and management: it can be an efficient tool in a fast and competitive environment especially for KI organisations and it can be a pertinent intercessor in terms of

inducing a cognitive shift with regard to collaborative and innovative organisational practices. Ergo, this transdisciplinary investigation also aims at consolidating and advancing the vernal field of study of learning sciences (Sommerhoff *et al.*, 2018).

The second one addresses research on collaborative practices by revealing three pertinent characteristics of mobile technology: enabling quick decision-making; connecting with a *glocal* network and fostering collective innovation. Based on the previous results, despite the blurring line between the professional sphere (formal environment) and the personal sphere (informal environment) people like to receive information on the go, to stay alert or aware, of "what's going on", without necessarily engaging with anything and being open to serendipitous experiences (Makri *et al.*, 2015).

5.1 Practical implications

The practical research highlights many advantages of the mobile device for creative practices and organisational management in a knowledge-intensive environment. Thus, beyond just being a tool, mobile devices are facilitating collaborative innovation practices by improving management decisions (Carayannis *et al.*, 2013; Makri *et al.*, 2017), enabling new business and/or operating models (Pont, 2013), developing a flow of ideas inner/outer the organisation or classroom (Hall *et al.*, 2020) and fostering the ability to make innovation. For example, because of mobile technology capability, quick decision-making can enhance managerial improvisation (Levallet and Chan, 2019). If managers could capitalise on this specific aspect, it might also contribute to the reduction of their information and communication technology (ICT) structure and systems.

5.2 Social implications

Mobile technology transforms our way to work (knowledge creation and/or conversion; Levallet and Chan, 2019) and it changes the relations between collaborators in a working environment (beyond physical boundaries). This study sheds light on how a creative and/or decision-making person can change their work schedule and/or routines based on the contextuality provided by current mobile devices (Cochrane *et al.*, 2016).

As these benefits have emerged from the analysis of our narratives, they cannot be conclusive. This paper argues that they can still be descriptive and indicative of fundamental principles for creating and understanding the organising of collaborative innovation and how mobile technology can be a key apparatus and interface between people and processes (Morel *et al.*, 2018; Dampérat *et al.*, 2019) in relation to affordances (Volkoff and Strong, 2013; Ahonen, 2011) and innovative practices (Makri *et al.*, 2017) to enable real-world learning (Saleh *et al.*, 2019) in formal and informal contexts.

Finally, our research suggests some potential directions for deeper explorations in terms of different target groups, markets, sectors, geopolitical environments. At this stage, the collected data unravel some weak signals with regard to mobile technology co-creative practices across diverse KI environments. It shall be pertinent to further investigate these findings through a quantitative approach to better ascertain path models (Huizingh, 2011) and to strengthen the new results with another qualitative perspective, for example.

One aspect that has not been covered in this study is the impact of governmental policies on digitalisation, the technology sector, technology education, technology investment and mobile affordances and usage. Also, Aotearoa/New Zealand has been identified as being among the top "World's Stand Out Digital Economies" (The Fletcher School and Mastercard, 2017) while France is defined as having a "high state of digital advancement while exhibiting slowing momentum" which implies that the context of this investigation shall require further international data or sampling. Likewise, this exploratory study would be more complete if the

additional investigation could be made with regard to collective and innovative practices in learning activities and processes in diverse sectors and/or cultural environments. For example, it could be part of a larger prospect which could include Agriculture, Energy, Transportation, Finance, Health and/or a few more. Yet, it might be interesting to further examine how, in a swift and shifting and borderless digital world, mobile technology can thrive on these cognitive and behavioural interactions with regard to a sustainable environment. Can mobile technology be the proxy of the "farmer" (Rogers, 1954) of the 21st century?

References

Ahonen, T. (2011), *Insiders' Guide to Mobile*, Tomi Ahonen Consulting, Chicago.

Allen, T.J. and Cohen, S.I. (1969), "Information flow in two R&D laboratories", *Administrative Science Quarterly*, Vol. 14 No. 1, pp. 12-19.

Alter, N. (2000), *L'innovation Ordinaire*, 6th ed., Presse Universitaire de France, Paris.

Amin, A. and Cohendet, P. (2004), *Architecture of Knowledge. Firms, Capabilities, and Communities*, Oxford University Press, Oxford.

Anders, A. (2016), "Team communication platforms and emergent social collaboration practices", *International Journal of Business Communication*, Vol. 53 No. 2, pp. 224-261.

Anderson, L.W., Krathwohl, D.R., Airasian, P.W., Cruikshank, K.A., Mayer, R.E., Pintrich, P.R. and Wittrock, M.C. (2001), *A Taxonomy for Learning, Teaching, and Assessing: A Revision of Bloom's Taxonomy of Educational Objectives*, Longman, White Plains.

Antonczak, L. (2019), "Scaling-up collaborative practices through mobile technology", The 25th International Conference on Engineering/International Technology Management Conference (ICE/ITMC), June 17-19, Nice.

Antonczak, L. (2020), "Mobile technology: a new ba of work organisation?", *Innovations – Journal of Innovation Economics and Management*, Vol. 31 No. 1, pp. 11-37.

Antonczak, L., Keegan, H. and Cochrane, T. (2016), "mLearning and creative practices: a public challenge?", *International Journal of Mobile and Blended Learning*, Vol. 8 No. 4, pp. 34-43.

Aral, S., Brynjolfsson, E. and Van Alstyne, M.W. (2007), "Productivity effects of information diffusion in networks", Available at SSRN 987499.

Askay, D.A. and Spivack, A.J. (2010), "The multidimensional role of trust in enabling creativity within virtual communities of practice: a theoretical model integrating swift, knowledge-based, institution-based, and organizational trust", The 43rd HI International Conference on System Sciences, January 5-8, HI.

Bathelt, H. and Turi, P. (2011), "Local, global and virtual buzz: the importance of face-to-face contact in economic interaction and possibilities to go beyond", *Geoforum*, Vol. 42 No. 5, pp. 520-529.

Baumeister, R.F. and Leary, M.R. (1997), "Writing narrative literature reviews", *Review of General Psychology*, Vol. 1 No. 3, pp. 311-320.

Bennis, W. and Biederman, P.W. (1997), *Organising Genius: The Secrets of Creative Collaboration*, Addison – Wesley, Boston.

Bhalla, V., Dyrchs, S. and Strack, R. (2017), "Twelve forces that will radically change how organizations work", available at: https://goo.gl/K6p394

Bonoma, T.V. (1985), "Case research in marketing: opportunities, problems, and a process", *Journal of Marketing Research*, Vol. 22 No. 2, pp. 199-208.

Botha, A., Vosloo, S., Kuner, J. and van den Berg, M. (2009), "Improving cross-cultural awareness and communication through mobile technologies", *International Journal of Mobile and Blended Learning (IJMBL)*, Vol. 1 No. 2, pp. 39-53.

Bratianu, C. (2010), "A critical analysis of the Nonaka's model of knowledge dynamics", The 2nd European Conference on Intellectual Capital.

Caniëls, M.C., Neghina, C. and Schaetsaert, N. (2017), "Ambidexterity of employees: the role of empowerment and knowledge sharing", *Journal of Knowledge Management*, Vol. 21 No. 5, pp. 1098-1119.

Carayannis, E.G. and Clark, S.C. (2011), "Do smartphones make for smarter business? The smartphone CEO study", *Journal of the Knowledge Economy*, Vol. 2 No. 2, pp. 201-233.

Carayannis, E.G., Clark, S.C. and Valvi, D.E. (2013), "Smartphone affordance: achieving better business through innovation", *Journal of the Knowledge Economy*, Vol. 4 No. 4, pp. 444-472.

Cecere, G. and Ozman, M. (2014), "Technological diversity and inventor networks", *Economics of Innovation and New Technology*, Vol. 23 No. 2, pp. 161-178.

Cheng, E.W., Chu, S.K. and Ma, C.S. (2019), "Students' intentions to use PBWorks: a factor-based PLS-SEM approach", *Information and Learning Sciences*, Vol. 120 Nos 7/8, pp. 489-504.

Cochrane, T.D. (2010), "Exploring mobile learning success factors", *ALT-J*, Vol. 18 No. 2, pp. 133-148.

Cochrane, T. and Antonczak, L. (2013), "Post web 2.0 media: mobile social media", Paper presented at the Mlearn2013 – 12th World Conference on Mobile and Contextual Learning, Doha, 22-24 October.

Cochrane, T. and Antonczak, L. (2015a), "Connecting the theory and practice of mobile learning: a framework for creative pedagogies using mobile social media", *Media Education*, Vol. 6 No. 2, pp. 248-269.

Cochrane, T. and Antonczak, L. (2015b), "Designing creative learning environments", *Interaction Design and Architecture(s) Journal – IxD&A*, Vol. 24, pp. 125-144.

Cochrane, T., Antonczak, L., Keegan, H. and Narayan, V. (2014), "Riding the wave of BYOD: developing a framework for creative pedagogies", *Research in Learning Technology*, Vol. 22, doi: 10.3402/rlt.v22.24637.

Cochrane, T., Narayan, V. and Antonczak, L. (2016), "A framework for designing collaborative learning environments using mobile AR", *Journal of Interactive Learning Research*, Vol. 27 No. 4, pp. 293-316.

Cohendet, P. and Simon, L. (2008), "Knowledge intensive firms, communities and creative cities", in Amin, A. and Roberts, J. (Eds), *Community, Economic Creativity, and Organization*, 9th ed., Oxford University Press, Oxford, pp. 227-254.

Crosby, B.C. and Bryson, J.M. (2010), "Integrative leadership and the creation and maintenance of cross-sector collaborations", *The Leadership Quarterly*, Vol. 21 No. 2, pp. 211-230.

Dampérat, M., Jeannot, F., Jongmans, E. and Jolibert, A. (2019), "Modélisation d'un processus de co-créativité: les apports du design et du management", *Current Directions in Psychological Science*, Vol. 34 No. 3, pp. 213-218, doi: https://doi.org/10.1111/j.1467-8721.2008.00577.x

Demil, B. and Lecocq, X. (2012), *Innovation Collaborative et Propriété Intellectuelle – Quelques Bonnes Pratiques (Annexe)*, Institut national de la propriété industrielle, Paris.

Dougherty, D. (2017), "Grounded theory research methods", in Baum J.A.C. (Ed.), *The Blackwell Companion to Organizations*, Blackwell Publishing Ltd, Oxford, pp. 849-866, doi: 10.1002/9781405164061.ch37.

Evans, B. (2016), "Mobile is eating the world", available at: https://goo.gl/jTj7rb

Fernández, W.D., Lehmann, H. and Underwood, A. (2002), "Rigor and relevance in studies of is innovation: a grounded theory methodology approach", The 10th European Conference on Information Systems (IS) and the Future of the Digital Economy, June 6-8, Gdan¨sk.

Ford, C.M. (1996), "A theory of individual creative action in multiple social domains", *Academy of Management Review*, Vol. 21 No. 4, pp. 1112-1142.

France Stratégie (2017), "Imaginer l'avenir du travail – Quatre types d'organisation du travail à l'horizon 2030", available at: https://goo.gl/gLjfWE

Fruchter, R. (2001), "Dimensions of teamwork education", *International Journal of Engineering Education*, Vol. 17 Nos 4/5, pp. 426-430.

Gibbons, M., Limoges, C., Nowotny, H., Schwartzman, S., Scott, P. and Trow, M. (1994), *The New Production of Knowledge: The Dynamics of Science and Research in Contemporary Societies*, Sage, London.

Glaser, V.L. (2017), "Design performances: how organizations inscribe artifacts to change routines", *Academy of Management Journal*, Vol. 60 No. 6, pp. 2126-2154.

Glazewski, K.D. and Hmelo-Silver, C.E. (2019), "Scaffolding and supporting use of information for ambitious learning practices", *Information and Learning Sciences*, Vol. 120 Nos 1/2, pp. 39-58.

Gomes, R.C. and de Oliveira Miranda Gomes, L. (2009), "Depicting the arena in which Brazilian local government authorities make decisions: what is the role of stakeholders?", *International Journal of Public Sector Management*, Vol. 22 No. 2, pp. 76-90.

Hall, T., Connolly, C., Grádaigh, S.Ó., Burden, K., Kearney, M., Schuck, S., Bottema, J., Cazemier, G., Hustinx, W., Evens, M. and Koenraad, T. (2020), "Education in precarious times: a comparative study across six countries to identify design priorities for mobile learning in a pandemic", *Information and Learning Sciences*, Vol. 121 Nos 5/6, pp. 433-442, doi: 10.1108/ILS-04-2020-0089.

Hamel, G. and Zanini, M. (2014), "Build a change platform, not a change program", available at: https://goo.gl/fZxJka

Huizingh, E.K. (2011), "Open innovation: state of the art and future perspectives", *Technovation*, Vol. 31 No. 1, pp. 2-9.

Jones, M. and Marsden, G. (2006), *Mobile Interaction Design*, John Wiley and Sons, West Sussex.

Kane, G.C., Bijan, A., Majchrzak, A. and Faraj, S. (2011), "The paradoxical influence of social media affordances on intellectual capital creation", *Journal of Computer-Mediated Communication*, Vol. 19 No. 1, pp. 38-55.

Kotter, J.P. (1996), *Leading Change*, Harvard Business School Press, Boston, MA.

Lave, J. and Wenger, E. (1991), *Situated Learning: Legitimate Peripheral Participation*, Cambridge University Press, Cambridge.

Levallet, N. and Chan, Y.E. (2019), "Organizational knowledge retention and knowledge loss", *Journal of Knowledge Management*, Vol. 23 No. 1, pp. 176-199.

Levallet, N. and Chan, Y.E. (2018), "Role of digital capabilities in unleashing the power of managerial improvisation", *MIS Quarterly Executive*, Vol. 17 No. 1, pp. 1-21.

Lewin, K. (1947), "Frontiers in group dynamics: concept, method and reality in social science; social equilibria and social change", *Human Relations*, Vol. 1 No. 1, pp. 5-41.

Lewin, K. (1947), "Group decision and social change", *Readings in Social Psychology*, Vol. 3 No. 1, pp. 197-211.

Majchrzak, A., Faraj, S., Kane, G.C. and Azad, B. (2013), "The contradictory influence of social media affordances on online communal knowledge sharing", *Journal of Computer-Mediated Communication*, Vol. 19 No. 1, pp. 38-55.

Makri, S., Bhuiya, J., Carthy, J. and Owusu-Bonsu, J. (2015), "Observing serendipity in digital information environments", *Proceedings of the Association for Information Science and Technology*, Vol. 52 No. 1, pp. 1-10.

Makri, S., Ravem, M. and McKay, D. (2017), "After serendipity strikes: creating value from encountered information", *Proceedings of the Association for Information Science and Technology*, Vol. 54 No. 1, pp. 279-288.

Mercier-Laurent, E. (2015), *The Innovation Biosphere: Planet and Brains in the Digital Era*, John Wiley and Sons, Hoboken.

Miles, R.E., Miles, G. and Snow, C.C. (2005), *Collaborative Entrepreneurship: How Communities of Networked Firms Use Continuous Innovation to Create Economic Value*, Stanford University Press, Stanford, CA.

Morel, L., Dupont, L. and Boudarel, M.R. (2018), "Innovation spaces: new places for collective intelligence?", *Collective Innovation Processes: Principles and Practices*, Vol. 4, pp. 87-107.

Nardi, B.A., O'Day, V. and O'Day, V.L. (1999), *Information Ecologies: Using Technology with Heart*, MIT Press, Cambridge, MA.

Neghina, C., Caniëls, M.C., Bloemer, J.M. and van Birgelen, M.J. (2015), "Value cocreation in service interactions: dimensions and antecedents", *Marketing Theory*, Vol. 15 No. 2, pp. 221-242.

Nikolić, D. and Natek, S. (2018), "Reassessing tacit knowledge in the experience economy", *Management*, Vol. 16 No. 18, pp. 495-503.

Nonaka, I., Toyama, R. and Konno, N. (2000), "SECI, BA and leadership: a unified model of dynamic knowledge creation", *Long Range Planning*, Vol. 33 No. 1, pp. 5-34.

Ollila, S. and Yström, A. (2016), "Exploring design principles of organizing for collaborative innovation: the case of an open innovation initiative", *Creativity and Innovation Management*, Vol. 25 No. 3, pp. 363-377.

Panahi, S., Watson, J. and Partridge, H. (2012), "Social media and tacit knowledge sharing: developing a conceptual model", *World Academy of Science, Engineering and Technology*, Vol. 6 No. 4, pp. 1095-1102.

Paulin, D. and Suneson, K. (2012), "Knowledge transfer, knowledge sharing and knowledge barriers – three blurry terms in KM", *Electronic Journal of Knowledge Management*, Vol. 10 No. 1, pp. 81-91.

Pont, B. (2013), "Learning standards, teaching standards and standards for school principals: a comparative study", Rapport no. EDU/WKP(2013)14. Centre of Study for Policies and Practices in Education (CEPPE), available at: www.oecd.org/officialdocuments/publicdisplaydocumentpdf/ (accessed August 6, 2020).

Presicce, C., Jain, R., Rodeghiero, C., Gabaree, L.E. and Rusk, N. (2020), "WeScratch: an inclusive, playful and collaborative approach to creative learning online", *Information and Learning Sciences*, Vol. 121 Nos 7/8, pp. 695-704.

Rogers, C.R. (1954), "Toward a theory of creativity", *ETC: A Review of General Semantics*, pp. 249-260.

Roser, T., Samson, A., Humphreys, P. and Cruz-Valdivieso, E. (2009), *Co-Creation: new Pathways to Value: An Overview*, Online, Promise and LSE Enterprise.

Saleh, A., Hmelo-Silver, C.E., Glazewski, K.D., Mott, B., Chen, Y., Rowe, J.P. and Lester, J.C. (2019), "Collaborative inquiry play: a design case to frame integration of collaborative problem solving with story-centric games", *Information and Learning Sciences*, Vol. 120 Nos 9/10, pp. 547-566.

Sawyer, R.K. (2005), "The new science of learning", *The Cambridge Handbook of the Learning Sciences*, Vol. 1, Cambridge University Press, Cambridge, UK, pp. 1-16.

Sawyer, R.K. (2008), "Optimising learning implications of learning sciences research", *Innovating to Learn, Learning to Innovate*, Vol. 45, pp. 35-98.

Shapin, S. (1995), "Here and everywhere: sociology of scientific knowledge", *Annual Review of Sociology*, Vol. 21 No. 1, pp. 289-321.

Slavich, B. and Svejenova, S. (2016), "Managing creativity: a critical examination, synthesis, and new frontiers", *European Management Review*, Vol. 13 No. 4, pp. 237-250.

Sommerhoff, D., Szameitat, A., Vogel, F., Chernikova, O., Loderer, K. and Fischer, F. (2018), "What do we teach when we teach the learning sciences? A document analysis of 75 graduate programs", *Journal of the Learning Sciences*, Vol. 27 No. 2, pp. 319-351.

Suire, R., Berthinier-Poncet, A. and Fabbri, J. (2018), "Les stratégies de l'innovation collective", *Revue Française de Gestion*, Vol. 3, pp. 71-84.

The Fletcher School and Mastercard (2017), "Digital evolution index 2017", available at: https://goo.gl/s83zN9

Tuckman, B.W. (1965), "Developmental sequence in small groups", *Psychological Bulletin*, Vol. 63 No. 6, pp. 384-399.

Vaioleti, S.L. (1999-2002), *Series of Talanoa*, Palo Alto, Oakland, San Francisco, CA.

Volkoff, O. and Strong, D.M. (2013), "Critical realism and affordances: theorizing IT-associated organizational change processes", *MIS Quarterly*, Vol. 37 No. 3, pp. 819-834.

Wenger, E. (1998), *Communities of Practice: Learning, Meaning, and Identity*, Cambridge University Press, Cambridge.

Woodman, R.W., Sawyer, J.E. and Griffin, R.W. (1993), "Toward a theory of organizational creativity", *Academy of Management Review*, Vol. 18 No. 2, pp. 293-321.

Further reading

Bourgeois, L.J. III, (1981), "On the measurement of organizational slack", *Academy of Management Review*, Vol. 6 No. 1, pp. 29-39.

Caniëls, M.C. and Rietzschel, E.F. (2015), "Organizing creativity: creativity and innovation under constraints", *Creativity and Innovation Management*, Vol. 24 No. 2, pp. 184-196.

Carcary, M. (2011), "Evidence analysis using CAQDAS: insights from a qualitative researcher", *Electronic Journal of Business Research Methods*, Vol. 9 No. 1, pp. 11-24.

Chesbrough, H., Vanhaverbeke, W. and West, J. (Eds) (2014), *New Frontiers in Open Innovation*, Oxford University Press, Oxford.

de Weerd-Nederhof, P.C. (2001), "Qualitative case study research. The case of a PhD research project on organising and managing new product development systems", *Management Decision*, Vol. 39 No. 7, pp. 513-538.

Duperrin, B. (2016), "La digital workplace Est pour tous les types d'employés", available at: https://bit.ly/2OBUx1a

Gambardella, A., Raasch, C. and von Hippel, E. (2016), "The user innovation paradigm: impacts on markets and welfare", *Management Science*, Vol. 63 No. 5, pp. 1450-1468.

Peirce, C.S. (1903 [1998), "Pragmatism as the logic of abduction (lecture VII, pp. 226-241", The Pierce Edition Projects, *The Essential Peirce: selected Philosophical Writings*, Vol. 2, IN University Press, Bloomington, pp. 1893-1913.

Penrose, E. (1959), *The Theory of the Growth of the Firm*, Oxford University Press, Oxford.

Taylor, M.L. and Søndergaard, M. (2017), *Unravelling the Mysteries of Case Study Research: A Guide for Business and Management Students*, Edward Elgar Publishing, Cheltenham.

Wright, A. and Linney, A. (2006), "The art and science of a long-term collaboration", available at: https://goo.gl/fjevcd

Yin, R.K. (1984] 2018), *Case Study Research: Design and Methods*, 6th ed., Sage Publications, Thousand Oaks, CA.

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