

Smart collaborative ecosystem: leading complex school systems

Smart
collaborative
ecosystem

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Abstract

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Purpose – The need to innovate and apply alternative forms of school organization is evident as the COVID-19 pandemic has generated a need to establish new conceptualizations of schools and education management. The paradigm shift in learning inexorably necessitates a corresponding paradigm shift in educational organization, administration and management in order to build organizational resilience and capital. This study proposed framework seeks to address this issue by proposing a transformation of educational organization and management, shifting away from the unilateral, hierarchical school models and towards a unique, smart collaborative school ecosystem in which residents, industries, schools, universities and research centers can create new digital knowledge and inventive products, services and solutions by enlarging their capitals.

Design/methodology/approach – Drawing upon Bourdieu's theory of social capital, our theoretical contribution is to present the influence of three forms of capital (social, economic and cultural) in cultivating educational capacity and resilience in the school ecosystem, with a particular focus on the role of digital capital in reinforcing the school ecosystem capitals. The authors also argue that ecosystem leaders and principals as boundary spanners play an important role in promoting capital exchange and enlargement as they balance the permeability of organizational boundaries at times of crisis by maneuvering across fields.

Findings – Achieving educational improvement and building organizational capacity and resilience through the enlargement of system (and subsystem) capitals requires that key actors develop synchronized interpretations of educational aims and functions in various contexts. The authors delineate the importance of developing a synchronization strategy in the proposed conceptualization of smart and resilient school ecosystems.

Originality/value – By integrating research from both non-educational and educational literature, the proposed framework provides a new perspective for educational administration, organization and management, shifting away from the unilateral, hierarchical school models toward a unique, smart collaborative school ecosystem in which members can create new knowledge by enlarging their capitals. Practical lessons for leaders and policymakers from our conceptual framework are proposed.

Keywords Bourdieu's theory of social capital, Digital knowledge capital, Ecosystem, School leaders, Boundary spanning, Synchronization

Paper type Academic paper

Introduction

The COVID-19 pandemic, which has left societies in a unique critical condition affecting all sectors of life, has generated a severe disruption of educational systems, influencing almost 1.6 bn students in more than 200 countries. Educational institutions have discontinued face-to-face classes, student dropout rates have increased and parents have been forced to assume increased responsibility and involvement in the education process (Striepe and Cunningham, 2022). Studies have shown that the roles of educational administrators are undergoing important changes as well (Grissom and Condon, 2021; Hill *et al.*, 2021; Hou and Cheng, 2022). For example, Grooms and Childs (2021) showed that to support their most vulnerable children, principals modified procedures by prioritizing the provision of food through breakfast and lunch programs, computers and tablets, wireless Internet access, and other necessities. An ever-increasing proportion of courses are now being taught online or in a hybrid setting as a result of the increased adoption of information and communication technologies (ICT) in education (Parmigiani *et al.*, 2021). According to Harris and Jones (2021), school leadership, administration and organization has moved in its alignment, and it will



probably not return to “normal” any time soon, if ever. Thus, the core of school leadership has been altered by the COVID-19 crisis (Pollock, 2020; Saide and Sheng, 2021).

While the COVID-19 pandemic continues to widen the outer boundaries of our personal and established resiliency, educational administration, organization and management still rely on traditional hierarchical theories and paradigm (Pinheiro and Young, 2017). This top-down perspective of policy mandates and school administration represents Taylor (1911) principles of scientific management (e.g. hierarchy, control, division of labor) as a manifestation of what may be called the Machine Age (e.g. Peters, 2010). This situation seems to reflect the consequences of the paradoxes inherent in many assumptions that have been made regarding the pertinence of globalization, smart technology and multiculturalism in facing the COVID-19 crisis.

Even though remote teaching enabled by digital technology is not completely new, these remote learning tools “have taken on renewed salience” during the COVID-19 pandemic (Williamson *et al.*, 2020, p. 108). In fact, the use of digitalized knowledge is one of the changes in education that has helped educational systems to adjust to the needs and demands of the digital economy, the so-called fourth industrial revolution. These same tools have been crucial in helping educational systems meet the challenges caused by the COVID-19 pandemic (Bromley *et al.*, 2021; Zajda and Rust, 2021). Digital knowledge can be seen as “a digital natural resource” or “digital capital” and has grown to have a world-changing influence in a rapid and unstable way (Correa *et al.*, 2021). Digital knowledge refers to knowledge created and managed through digital products (Walton, 2015). However, the use of digital knowledge creates a fundamental shift in the aims, content, structure, and approach of educational administration and leadership to build organizational resilience and capital. This produces a paradoxical reality of educational institutions that are expected to develop innovative frameworks in an environment based on both accountability (global unification) and survival (local particularization). The question then becomes: How can an administrative structure for school management be designed to simultaneously create knowledge, skills and competencies through policies that are better suited to the changed needs of the current education system?

Our proposed framework seeks to address this issue by proposing a transformation of educational organization and management, shifting away from the unilateral, hierarchical school models and towards a unique, smart collaborative school ecosystem in which residents, industries, schools, universities, and research centers can create new digital knowledge and inventive products, services, and solutions by enlarging their capitals. Studies have focused on knowledge management to promote the creation of innovative solutions (Nahapiet and Ghoshal, 1998; Sherif *et al.*, 2006). However, few studies have addressed the creation and sharing of digital knowledge, virtual communities, schools and stakeholders within the educational context, or how schools can benefit from the stimulation of digital capitals for knowledge creation exchange. Accordingly, the proposed framework will incorporate digitalized knowledge creation and exchange as mechanisms that may enable the development of school ecosystem capitals and resilience. A new and innovative educational framework aimed at developing a societal model of growth would address the current and future global and local crises in education.

In the following sections, we introduce the concept of a smart collaborative school ecosystem. By integrating research from both non-educational and educational literature, this article seeks to provide a new perspective for educational administration, organization and management, reframing school system management through a *synchronization* strategy based on digital knowledge creation and ecosystem capital enlargement. Our aim is to propose a conceptual framework with a new set of possible structures and leadership practices. Drawing upon Bourdieu’s theory of social capital, our theoretical contribution is to present the influence of three forms of capital (social, economic and cultural) in

cultivating educational capacity and resilience in the school ecosystem, with a particular focus on the role of digital capital in reinforcing the school ecosystem capitals. Yet, the concept of capital is unequivocally related to the concept of field (Bourdieu, 1985). Accordingly, an additional contribution of the paper is to elaborate on the importance of boundary management practices within Bourdieu's concept of field, defined as the social space in which key players – educational boundary spanners – form partnerships to promote significant changes in educational policy, practices and resource flows. Therefore, we also argue that ecosystem leaders and principals as boundary spanners play an important role in promoting capital exchange and enlargement as they balance the permeability of organizational boundaries at times of crisis by maneuvering across fields. Furthermore, we point to the important role of principals and key actors to develop *synchronized* interpretations of educational aims and functions. Such functions are essential in improvement initiatives, all influenced by environmental challenges either threatening their capital or securing it. Accordingly, we will delineate the importance of developing a *synchronization* strategy in the proposed conceptualization of smart and resilient school ecosystems. Practical lessons for leaders and policymakers from our conceptual framework will be proposed.

Conceptual framework

Promoting organizational capacity and resilience: the need for a new management perspective

A fundamental concern for schools worldwide is to build organizational capacity and resilience. Boin *et al.* (2013) mention that leaders' purpose should be to improve organizational resilience before, during and after a crisis. Resilience is an important issue for the whole school organization including faculty, staff and students (Pinskaya *et al.*, 2019). Resilience is usually identified as the capacity of an individual, family, community or environmental system to return to normative performance after experiencing an unusual stressor (Allan and Ungar, 2014). Vogus and Sutcliffe (2007) define organizational resilience as “the maintenance of positive adjustment under challenging conditions such that the organization emerges from those conditions strengthened and more resourceful. By ‘challenging conditions’ we include discrete errors, scandals, crises, and shocks, and disruptions of routines as well as ongoing risks (e.g. competition), stresses, and strain” (p. 3418). This understanding of resilience, which is centered on the individual or system that recovers from stress, has in recent years shifted to a more dynamic understanding of resilience as the quality of the interactions between systems and the resources they need to do well (López-Aymes *et al.*, 2020).

Educational systems and schools are complex and thus are predisposed to crisis events disturbing their resilience. For instance, the first days of the COVID-19 pandemic were marked by several fundamental challenges for educational leaders such as the exceptional nature of the crisis, the fast timeline and the associated uncertainty that obstructed successful solutions (Grissom and Condon (2021). Educational institutions adopted a range of learning techniques in their efforts to minimize disruptions to their students' education (Crompton *et al.*, 2021). E-learning devices played a key role during the pandemic, assisting schools and students during closure periods (Subedi *et al.*, 2020). Educational institutions implemented “education in emergency” programs across several virtual platforms and were required to implement a structure for which they planned (Sy *et al.*, 2022). This “education in emergency” or “emergency remote education” and/or “pandemic pedagogies” were used to illustrate learning procedures and to contextualize the phenomenon under the exceptional conditions in which these adjustments occurred (Gherheş *et al.*, 2021). Thus, during crisis, and especially during the pandemic period, the importance of digitalized knowledge in the education field was emphasized and recognized.

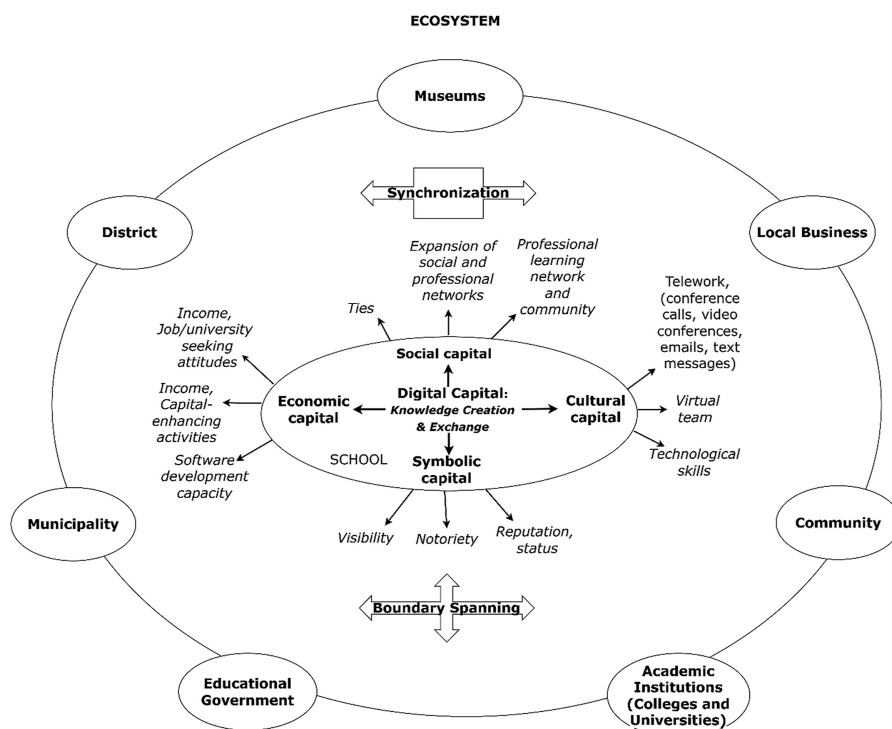
Creation of a smart collaborative school ecosystem: a new perspective

Today's innovation processes are more open and demand more resources to acquire and transfer knowledge both inside and outside the educational organization's boundaries, making digital knowledge management even more pertinent (Correa *et al.*, 2021). The possibility and ability to transfer organizational resources and knowledge is a significant element in continuously acquiring a competitive advantage while increasing benefits (Torres *et al.*, 2018). According to Bourdieu, owning economic, cultural, social and symbolic capital represents the essential source of power in a society. However, since the process of capital development is ongoing and dynamic, and therefore prone to both attrition and accumulation, the power stemming from these types of capital is varying as well (Bourdieu, 1985).

Capital varies by field, which means that different forms of capital are dominant in different fields. Different fields are managed by diverse logics, structures and rules that consider social roles and interactions between those positions. Positions within the field may be filled by organizations (e.g. schools, business) or by specific social actors (such as principals, teachers or stakeholders). The division of various forms of resources or capital determines positions in a field. A field's forms of autonomy and how status and power are seen therein are also correlated with field effects (Rawolle and Lingard, 2013). Therefore, the negotiating power of individuals (e.g. principals, and ecosystem leaders) and organizations (e.g. local business, educational institutions) depends on the capital at their disposal (Bordogna, 2019; Purcell *et al.*, 2020). There, the relationships among the key players' relationships are constantly shifting. Each field thus produces the boundaries within which students, teachers, leaders, schools and all the other entities that exist within the ecosystem behave daily. The consequences are that success in policy implementation depends on having the proper amounts of each type of capital and that management entails understanding the means of capital exchange and accumulation within the ecosystem.

For example, schools constitute a sub-field operating within the broad educational field in which the main actors are educational ministries, school districts, school communities, non-profit organizations and public bodies. All of these are nested inside a variety of fields that are organized hierarchically, including the economic and political fields which are dominant and serve as the primary source of funding for public organizations. To illustrate, according to McLeod and Dulskey (2021), during the COVID-19 epidemic, school administrators focused their leadership on strategies for communication and family involvement. They recognized the necessity for frequent communication with parents. Also, school administrators acknowledged how much they depend on knowledge shared across companies and geographical borders. They constantly monitor external events, utilizing their networks, and establishing connections with peers and other schools' principals. Similarly, according to research, effective parent-teacher connections and partnerships with neighborhood institutions can serve to supply crucial pedagogical and instructional resources (Valli *et al.*, 2018) and therefore capitals.

Figure 1 illustrates the elements of the proposed smart collaborative school ecosystem. The several components reflect the digital capital which, combined with different capitals (cultural, economic, social and symbolic), will allow the school as a system to become a means of knowledge creation, conveying, implementing, and absorbing the knowledge of other fields and organizations in the ecosystem. According to the proposed framework, knowledge creation and exchange are central mechanisms in the proposed smart ecosystem perspective. The other fields and organizations are noted as part of the school environment in the ecosystem (educational institutions, communities, museums, school districts, local businesses, city councils and so on). The arrows reflect an ecosystem based on several forms of interrelated components providing a platform for knowledge sharing among all leaders, stakeholders and shareholders through boundary spanning in the school ecosystem to promote the school ecosystem's capitals. Each school ecosystem component can influence



Source(s): Created by author

Figure 1.
The smart
collaborative school
ecosystem

and be influenced by shared digital knowledge and networks enhancing each part of the system capital through exchange and transaction (students working in the community), creating a community of opportunities, and importantly, creating and exchanging digital knowledge. In addition, achieving educational improvement and building organizational capacity and resilience through the enlargement of the system (and subsystem) capitals requires that key actors synchronize interpretations of educational aims and functions in various contexts, thus building smart collaborative and resilient school systems. Thus, the smart collaborative ecosystem is a new structure that enables public and private sectors as well as social actors, frequently with different traditions and objectives, and of different sizes and areas of influence to operate together and create capitals in a symbiotic relationship.

The elements of the proposed ecosystem perspective

The capitals of schools: Bourdieu's framework. Bourdieu (1986) differentiates between three types of capital: economic capital, social capital and cultural capital. All capitals can be converted into a symbolic capital (Bourdieu, 1986). Economic capital (money) can be exchanged for cultural capital (studies and education), thereby enabling the growth of more economic capital and/or social capital (relationships with classmates, instructors and more). These forms of capital may be accrued and transformed into other forms of capital.

Digital capital: knowledge creation and flow. Following Bourdieu's theory of capital, digital capital can refer to "a set of internalized ability and aptitude". These include digital skills as well as "externalized resources", digital equipment that can be assembled and moved from

one field to another. Educational workers' digital capital consists of a combination of all their knowledge, skills and attitudes, complemented by their personal and professional social networks or relationships, which influence their engagement with technology (Philipsen *et al.*, 2019). The extent of digital capital determines the quality of the ICT which may be exchanged thereby into other types of capital (economic, social and cultural).

According to Moran and Ghoshal (1999) all knowledge creation can occur through two basic processes of combination and exchange under two conditions that must exist. As the first condition, the authors identified the importance of the opportunity (or accessibility/availability). The second condition for knowledge creation refers to the importance of motivation and commitment to knowledge exchange. Therefore, processes aimed at enhancing knowledge flow both within and outside organizations (i.e. school and business infrastructures) are especially significant for knowledge resources to be exchangeable within and across organizations (Zhang *et al.*, 2021). Digital knowledge exchange thus can build on organizations' digital capital and capacity to innovate and improve.

Economic capital. Economic capital is linked to financial resources and estate titles that are directly exchangeable for money. Economic capital represents the most significant kind of capital because it is immediately convertible to money (Bourdieu, 1986). For instance, certain forms of digital capital are already exchangeable into economic capital (e.g. software development capacity) (Ignatow and Robinson, 2017) or activities that increase capital and a job-seeking/university opportunity mindset (such as looking for jobs and universities online, putting together a professional resume and using social media for this purpose) (Ragnedda, 2018).

Social capital. The essential and stable definition of social capital centers on resources embedded in social relationships and social networks (Lin and Erickson, 2008). The social relationship is crucial, as it permits access to the resources held by other members of the group to which a person belongs. Therefore, some characteristics such as (strong/weak) ties, "visibility/role of members in the network, knowledge, size"/quality of social networks, can play a major role in raising a person's social status and increasing his or her social capital. The term "digital social capital" describes people's electronic networks and the social support they receive as a result (Seale, 2013). The usage of technology by students, teachers and faculty is influenced by their access to digital social and cultural resources (Philipsen *et al.*, 2019; Seale *et al.*, 2015).

Cultural capital. Cultural capital can be described as the advantages obtained from involvement in cultural activities. This can take the form of narratives, habits, traditions and principles shared in the community, school or business. Culture capital can improve the reputation and expertise of a school, community or business, providing value for those to which these resources are available (Sutherland and Burton, 2011). Cultural capital develops in three distinct conditions: incorporated, objective and institutionalized (Bourdieu, 1983). These conditions are articulated in terms of kinds of competences, instruction, knowledge and benefits that can be used to acquire other resources and capitals (Callaghan and Colton, 2008). Cultural capital develops and manifests itself in individual character, behavior and capacities (incorporated cultural capital). Thus, the combination of knowledge, enthusiasm and abilities required for technology management as a type of embedded cultural capital reflects the digital cultural capital (Ollier-Malaterre *et al.*, 2019). These in turn provide access to educational accomplishments that provide the individual with social status and power, which in turn institutionalized in terms of cultural (including academic) valuation and thus, ultimately, in educational qualifications (institutionalized cultural capital). Callaghan and Colton (2008) point out the importance of cultural capital for the resilience and improvement of a community. According to Seale (2013), digital cultural capital is the work and time that people or groups put into improving their technological knowledge and abilities through a variety of formal and informal learning opportunities. Technology use is socialized through a

variety of socialization agents, such as family, peers and digital devices (combination of personal computers, the Internet, mobile communications and social media) to create this digital cultural capital.

Symbolic capital. Bourdieu (1998) defines symbolic capital as the conception, insight and appreciation of the importance ascribed to all kinds of capital, namely, economic, social and cultural capitals. Symbolic capital is represented in terms of reputation, notoriety, status and individual authority. Symbolic capital lives within a person. Symbolic capital is seen as the synthesis of the other capitals and is essential to their usage in that it enables the transformation of social and/or cultural capital to economic capital (Gergs, 2003). Thus, symbolic capital indicates how an individual is estimated by others. This interaction helps individuals to transform digital resources into economic, social and cultural resources and to exploit the full advantages offered by the digital tools.

The interaction between digital and the other forms of capitals can hopefully improve the individual, school and system networks. For example, the relationship between these forms of capital can result in accumulated competencies: (1) *Virtual learning communities (strong ties)*: the Internet can be converted into a trust-based platform for common concerns, informing people, publishing information and improving school ecosystem members' engagement and learning (Boyd and Ellison, 2007) by bringing together people with similar purposes; (2) *Ties*: the opportunity provided by the Internet can help to strengthen the "relational capital" of Internet users in the school ecosystem by producing valuable contacts; (3) *Expansion of social and professional networks*: the Internet can create platforms of knowledge sharing (Johnston et al., 2013). Importantly, new contacts can be made because of a "snowball effect" through which new relationships begin, and new contacts and relationships can be established among people that find themselves partners in "groups of interest" or virtual professional learning communities; (4) *Improved visibility*: the Internet and social media are key platforms for increasing connectivity among members, leaders, communities and institutions, ultimately improving the school ecosystem's visibility in the global realm.

Principles, trust, exchange and standards may be regarded as fundamental components of a virtual experience that enables users in the school ecosystem to collect information as a result of their belong to a virtual community and an online social network. This shows that the current social capital of Internet users founded on connections and trust can aid in the creation of virtual professional communities in the school ecosystem aimed at generating benefits for their members. Social, cultural and economic capitals promote the creation and enlargement of a digital capital, which in turn can positively influence the amount, quality and types of virtual activities taking place in the school ecosystem, thus promoting reciprocally to the social, cultural and economic capitals (Van Deursen and Van Dijk, 2014); consequently, improving the position of a school in the ecosystem and building resilience.

Synchronization in the smart school ecosystem

The proposed ecosystem approach is holistic and acknowledges that no component of the ecosystem evolves in a vacuum. Rather, they are relationally embedded with providers, consumers, agencies, institutions and financial sources. Rooted in various types of societal relationships, either through formal or informal networks, schools and their leaders are influenced in their decision-making processes and their performance outcomes (Turkina and Thai, 2013). Thus, a smart school ecosystem highlights the influence of external factors and fields such as the school context and the individual capacity of its key players – boundary spanners – to synchronize their actions and to ensure flexibility and timely collaboration, facilitating capital accumulation and building up resilience. As such, the proposed model of a smart school ecosystem will enable organizations to improve the conditions for knowledge creation and flow thereby enlarging the schools' capital and ultimately the school ecosystem's capital.

For school ecosystem's capitals to be accrued and transformed into new forms of capital, a synchronization is essential, especially during crises situations. Synchronization, a perception embedded in theories of nonlinear dynamical systems and complexity science, can be illustrated from two viewpoints. The first refers to the system dynamics level – smart ecosystem – and the second refers to the degree of influence among system components (schools, educational institutions, communities, museums, school districts, local businesses, city councils and so on). Synchronization at the system level means the synchronization in time among the system components (Schmidt and Richardson, 2008). At the component level, synchronization can be perceived as having a reciprocal impact, with regular indicators coming at a component from other components (Uhlhaas *et al.*, 2009). Both views of synchronization correspond to the bindings of dynamics and interdependency. Such binding does not entail executing the same activity concurrently, but instead requires reciprocal dynamics across ecosystem fields.

To develop a capability for synchronization, dynamic processes are central. These processes highlight the nature of synchronization, with the recurring interactions of assignments, encounters and environmental restrictions (Waddell and Zochowski, 2006) that follow from the possession of capital and the power of the relevant agents in each field and or system/sub-system. The basic notion is that several patterns of components are created and transformed alongside the improvement and accomplishment of the task. Accordingly, several subsystems within the ecosystem will synchronize to complete a project and then de-synchronize as soon as the project is completed (Ziembowicz *et al.*, 2013). Over time, then, a school ecosystem can be differentiated by the level and patterns of synchronization between school ecosystem players.

Therefore, through a professional, digitalized network of knowledge sharing within the school ecosystem, educational administrators can create the social conditions necessary for crisis prevention and management, which requires a synchronization change movement. With the modification of the mission requirements in order to prevent and manage crisis, a repetitive transformation of distinct operational components offers the arrangement needed to accomplish new tasks. Pursuant to this theory, social processes do not denote the result of stable structures (service provider and service receiver), but instead correspond to intrinsically dynamic systems synchronization to achieve educational improvement in various contexts.

COVID-19 provided an illustration of the synchronization at the (eco)system level of capitals, as students and the teaching staffs had to form new social learning arrangements in various locations in the municipality as the traditional learning formation in classes posed health risks. For example, beyond school boundaries, students learned in museums, local high and low-tech firms, outdoor recreation centers, etc. Based on digital alternative applications, this phenomenon of synchronization impacted the formation and transmission of capitals in the ecosystem. Another research (Grooms and Childs, 2021) recently demonstrated how principals were able to reorganize teaching by changing how teachers cooperated with each other in ways that enabled them to better benefit from digital resources and virtual spaces and to restructure support systems to be more useful. This shifting and re-shifting of capitals in the collective arena can serve as an example of re-socialization of capitals within educational systems and between educational and non-educational institutions in the ecosystem.

Anchoring the new perspective in leaders' ecosystem everyday practices

- (1) *Leaders' role in promoting smart leadership.* Research has shown that the level of e-inclusion and forms of Internet activity are determined not only by ones' abilities, but also by the attention (or lack of it) one expresses in employing digital tools. It is

also affected by the person's position in the social structure (e.g. principal, staff member, stakeholder) (Parmigiani *et al.*, 2021). In fact, absence of concern about securing new technologies in order to participate in the digital arena, or lack of ability to navigate the web, produces a type of self-exclusion from the digital sphere. Research has been conducted on digital leadership in education and schools (e.g. Chang, 2012; Esplin *et al.*, 2018; Raman *et al.*, 2014; Pollock, 2020). This research has shown that digital leadership enhances and promotes the use of technological practices in teaching and learning. For instance, a principal's approach to digital techniques impacts teaching effectiveness and teachers' capacity to incorporate digital tools (Chang, 2012). Similarly, in their study, Raman *et al.* (2014) described the positive influence of school leaders' practices on the use of digital tools in teachers' classrooms. School leaders served as role models and influenced teachers' attitudes through their interaction. During the COVID-19 pandemic, research indicated that by changing the way teachers engaged and worked together, principals were able to restructure education and teaching. They also used technology and virtual spaces to revamp support systems to be more effective and efficient (Grooms and Childs, 2021). Therefore, being a digital educational leader necessitates a capacity to use ICT, to promote a vision emphasizing the importance of integrating digital tools into the educational process and to promote knowledge exchange within and across the school boundary (Jones and Dexter, 2018; Richardson and Sterrett, 2018).

- (2) *Leaders' role in managing their organizational boundaries.* Society provides massive amounts of information through technology, which has generated continuous changes in social, economic, labor and other conditions worldwide (Zimmerman and Anderson, 2021). This new arena involves new patterns of competitiveness and performance, using the resources available without adversely affecting their existence in the future (McMillan *et al.*, 2016). Therefore, leadership roles require maintaining influence both internally and beyond the institution by leading and working across institutional, disciplinary and professional boundaries (Benoliel, 2020).

First developed by Thompson (1967), boundary spanning roles entails connecting the organization and its environment through relations. In open systems theory, the environment is characterized as "everything . . . outside the system's boundary" (Immergart and Pilecki, 1973, p. 36). Leaders as boundary spanners must span boundaries and maintain high levels of interactions with critical external parties (Benoliel, 2017; Shaked and Benoliel, 2022). The two main functions of these boundary spanning roles are to process information (that is, to obtain it from outside of the organization or unit and to disseminate it internally) and to represent the organization or unit externally (Aldrich and Herker, 1977; Tushman and Scanlan, 1981). Cohen and Levinthal (1990) define "gatekeepers", or "boundary spanners", individuals who "translate" external knowledge into opportunities for improving the ongoing learning and other activities.

Boundary spanning activities involve: (1) knowledge transfer and exchange, (2) coordinating and facilitating collaboration between diverse interests, bodies and agencies, (3) building commitment and (4) bridging relationships with external stakeholders as well as with internal partners and co-workers (Benoliel, 2017, 2020; Bordogna, 2019; Carlile, 2004). For example, working on advancing the organization's reputation, excellence and visibility with respect to internal and external constituencies as well as being aware of events that might threaten the reputation and the smooth functioning of the organization remain key objectives in the work of a boundary spanner leader (Bolden *et al.*, 2012; Purcell *et al.*, 2020).

Accordingly, to promote organizational capital, leaders in the school ecosystem engage in boundary spanning activities aimed at promoting exchange and creation of resources and knowledge both within and across their organization. Thus, when boundary spanners leverage social networks, they are better able to react to educational opportunities and threats by adopting innovative practices (academic achievements, teaching and learning) and thereby actively generate success and growth (Shaked and Benoliel, 2022).

When physical distance made it difficult for people to share tacit knowledge openly during the pandemic, boundary spanners played a crucial role in gathering information from outside agencies and relaying it to their inner groups (Schotter, 2021). In the school context, principals and school administrators are required to gather resources and information about environmental changes and developments and make it available to school faculty members (Benoliel, 2020). In terms of pedagogical considerations, it can be argued that principals have traditionally served as boundary spanners for their school communities (Shaked and Benoliel, 2022). But in 2020, they also assumed a new responsibility: guiding their school community through the confusing web of health and safety regulations that the media, the Internet and official government communications were spewing out (Burke and Dempsey, 2022). Principals engaged in the creation of contracts with Wi-Fi vendors and the management of community donations of technical devices for their students. Similarly, Grooms and Childs (2021) investigated changing routines in US schools in response to COVID-19 school closures, and indicated that with minimal guidance and under the watchful eyes of the community and other external stakeholders, principals were expected to navigate both local and federal educational policies. Accordingly, within the smart school ecosystem, principals and district leaders may form relationships not only with official external institutions and local governmental authorities but also with private or philanthropic organizations to obtain knowledge and resources, such as digital infrastructure.

- (3) *Leaders' role in exploiting and exploring new capitals.* In order to cope with both local and global challenges and crises, we recommend that leaders maintain a balance between the exploitation of the organization's capitals on the one hand and the exploration of new capitals on the other hand. This would mean that principals would rely for instance on their teachers' known pedagogical capabilities. Thus, we propose that principals would simultaneously develop new high-level digital and online pedagogies, and support distance learning (i.e. capital enlargement). Also, principals using trial-and-error in an uncertain space, promote processes aimed at preserving constancy of learning enabling the teaching staff to maintain the teaching activities (i.e. preservation), while also supporting knowledge creation through smart pedagogies adapted to diverse students learning online in various geographical locations (i.e. innovation) (Harris and Jones, 2021). Studies have emphasized principals' key role in combining preservation and innovation of resources and capital, especially during times of crisis (Bingham and Burch, 2019). For example, recent research of Beauchamp *et al.* (2021) performed during the COVID-19 pandemic indicated that principals combined both preservation and exploitation of existing resources, together with the exploration and implementation of novel technologies, in order to overcome the crisis. These principals were characterized as successful in shifting, assembling and dissolving capitals during the pandemic crisis.
- (4) *Leaders' role in promoting synchronization capacity among ecosystem players.* Achieving educational innovation and performance even during global and local crises necessitates that school ecosystem players develop synced interpretations of the educational aims in that context (Fullan and Quinn, 2015; Sullanmaa *et al.*, 2019). This requires principals, educational administrators and policymakers to

deliberate on policies that can be practically implemented. To this end, promoting digital knowledge flow and knowledge creation necessitates flexible settings and structure, in order to enable and encourage diverse ecosystem partners to voice their opinions and knowledge. Facilitated by an expert in digital pedagogy and learning communities, a virtual “thinking room” can be created on the ecosystem level in which simulations of different situations are performed, enabling experimentation and expression. Specifically, ecosystem leaders such as principals, district leaders and policymakers can create multidisciplinary teams to support the knowledge acquisition procedures by considering possible outlet avenues. Ecosystem leaders can familiarize ecosystem players with functional and creative teamwork to facilitate coordinated procedures based on possible actions. For example, maintaining learning facilities based on technologies like conference rooms with distance learning can foster an online professional learning culture. Thus, district leaders can promote learning facilities, and principals and coaches can facilitate teachers’ adoption of distance learning and program development opportunities.

[Kofman and Senge \(1993\)](#) suggest designing a deliberative practice field – a field of play. This field of play enables the participants to model solving educational problems in a provisional mode (resembling their real educational context), which is safe for experimental “play”. As a result of performing simulations in a safe virtual practice field, school ecosystem stakeholders can challenge and alter their internal mental models; thus synchronize their interpretations of educational aims and functions. Therefore, a smart collaborative school ecosystem can be based on digital data collection and sharing in the ecosystem, shifting and circulating capitals to create and enlarge the school ecosystem’s digital capital.

Final thoughts

The COVID-19 pandemic, which has left societies in a uniquely serious situation impacting all areas of life, generated a severe disruption of educational systems. However, crises affect diverse communities differently, requiring leadership responses to critical localized needs. Thus, on the wider socio-cultural and political level, school leaders must consider *how* and *to what extent* the smart collaborative ecosystem is influenced and managed by governments and national organizations. Policy changes during a crisis may exacerbate economic inequalities through various (mis)use of capitals. For example, COVID-19 lockdowns have shown the already-existing digital divides and socio-economic inequalities between countries ([UNESCO, 2021](#)). Schools in low-income countries are still struggling to deliver quality remote learning programs due to limitations of technological infrastructure and additional resources.

Following Bourdieu’s theory of social reproduction, cultural capital is perceived as being mainly produced and conveyed within families, and in turn within classes, promoting inequality. In this way, dominant classes accomplish and maintain a successful domination of capitals. Accordingly, the proposed perspective that emphasizes how digital, economic, cultural and social capitals are interconnected and interdependent can imply that traditional social inequalities may be reproduced, if not strengthened. However, research has shown that in contemporary societies the family is not the only locus of the production or transmission of cultural capital ([DiMaggio, 2019](#)). Research has indicated that schools not only “reproduce” cultural capital but also, in a certain sense, create it ([Goldthorpe, 2007](#)). This offers the opportunity for schools to break the “cycle of privilege” through which several capitals are secured by those from more privileged and educated families. In fact, schools and the educational opportunities they offer do present an opportunity to redistribute cultural capital to families that lack it ([DiMaggio, 2019](#)). Therefore, the proposed smart ecosystem can play a

key role in this process. Consequently, schools, as well as other educational and non-educational institutions in the ecosystem, can act as key actors of re-socialization. To this end, they can not only help secure and provide capitals but also, in certain cases, balance, compensate for, or even impede family impacts in the formation and transmission of capital. Thus, the proposed smart collaborative ecosystem perspective should be extended to discuss how social, national and economic capitals in various international contexts can shape equal opportunities in school ecosystems, and the role that school leadership can play in this regard.

Can we forecast a trajectory of smart school ecosystems in which social, cultural, economic and digital capitals are shifted and circulated through synched interpretations of educational aims and functions, promoting organizational resilience and capital enlargement, especially during times of crisis? Can ecosystem players shift the school/organizational focus/paradigm into a more holistic synched ecosystem perspective? Can a holistic synched ecosystem perspective lead primarily to adapting to changing circumstances (i.e. crises) or might it instead lead to a synchronized stagnation/paralysis? Practically, can these ideas shape our actions or shift our approach as most principals, and even school district leaders, do not have the discretion to make large structural changes to the way the schools in their purview function? Can educational researchers shift into more holistic and encompassing inquiry methods to capture reconstructions of social, cultural, economic and digital capitals in times of adversity and crisis? Especially during crises situations, our perspective focuses on resilience as the quality of the continuous interactions of capitals in the ecosystem. This tightly coupled circulation of capitals in the smart ecosystem may allow students, staff members, families and communities to return to some normative level of performance after experiencing an unusual stressor (Allan and Ungar, 2014). Therefore, this perspective requires ecosystem leaders as well as researchers to predict and evaluate how the shifting capitals influence resilience, thus “connecting the dots” to understand capitals’ interactions, benefits and broad effects.

References

- Aldrich, H. and Herker, D. (1977), “Boundary spanning roles and organization structure”, *Academy of Management Review*, Vol. 2 No. 2, pp. 217-230.
- Allan, R. and Ungar, M. (2014), “Developing a measure of fidelity for an ecological approach to family therapy”, *Journal of Family Psychotherapy*, Vol. 25 No. 1, pp. 26-41.
- Beauchamp, G., Hulme, M., Clarke, L., Hamilton, L. and Harvey, J. (2021), “People miss people: a study of school leadership and management in the four nations of the United Kingdom in the early stages of the COVID-19 pandemic”, *Educational Management, Administration and Leadership*, Vol. 49 No. 3, pp. 375-392.
- Benoliel, P. (2017), “Managing school management team boundaries and school improvement: an investigation of the school leader role”, *International Journal of Leadership in Education*, Vol. 20 No. 1, pp. 57-86.
- Benoliel, P. (2020), “Principals’ boundary activities and school violence: the mediating role of school management teams”, *Educational Management Administration and Leadership*, Vol. 48 No. 2, pp. 286-304.
- Bingham, A.J. and Burch, P. (2019), “Reimagining complexity: exploring organizational ambidexterity as a lens for policy research”, *Policy Futures in Education*, Vol. 17 No. 3, pp. 402-420.
- Boin, A., Kuipers, S. and Overdijk, W. (2013), “Leadership in times of crisis: a framework for assessment”, *International Review of Public Administration*, Vol. 18, pp. 79-91.
- Bolden, R., Gosling, J., O’Brien, A., Peters, K., Ryan, M.K., Haslam, S.A. and Winklemann, K. (2012), *Academic Leadership: Changing Conceptions, Identities, and Experiences in UK Higher Education*, Leadership Foundation for Higher Education, University of Exeter, London.

-
- Bordogna, C.M. (2019), "The effects of boundary spanning on the development of social capital between faculty members operating transnational higher education partnerships", *Studies in Higher Education*, Vol. 44 No. 2, pp. 217-229.
- Bourdieu, P. (1983), "Les sciences sociales et la philosophie", *Actes de la recherche en sciences sociales*, Vol. 4 No. 1, pp. 45-52.
- Bourdieu, P. (1985), "The social space and the genesis of groups", *Social Science Information*, Vol. 24 No. 2, pp. 195-220.
- Bourdieu, P. (1986), "The forms of capital", in Richardson, J. (Ed.), *Handbook of Theory and Research for the Sociology of Education*, Greenwood Press, New York.
- Bourdieu, P. (1998), *Practical Reason. On the Theory of Action*, Stanford University Press, Stanford, CA.
- Boyd, D.M. and Ellison, N.B. (2007), "Social network sites: definition, history, and scholarship", *Journal of Computer-mediated Communication*, Vol. 13 No. 1, pp. 210-230.
- Bromley, P., Overbey, L., Furuta, J. and Kijima, R. (2021), "Education reform in the twenty-first century: declining emphases in international organisation reports, 1998-2018", *Globalisation, Societies and Education*, Vol. 19 No. 1, pp. 23-40.
- Burke, J. and Dempsey, M. (2022), "The impact of COVID-19 on educational leader wellbeing", *Handbook of Research on Cyberchondria, Health Literacy, and the Role of Media in Society's Perception of Medical Information*, IGI Global, Hershey, PA, pp. 217-232.
- Callaghan, E.G. and Colton, J. (2008), "Building sustainable and resilient communities: a balancing of community capital", *Environment, Development and Sustainability*, Vol. 10 No. 6, pp. 931-942.
- Carlile, P.R. (2004), "Transferring, translating, and transforming: an integrative framework for managing knowledge across boundaries", *Organization Science*, Vol. 15 No. 5, pp. 555-568.
- Chang, I.H. (2012), "The effect of principals' technological leadership on teachers' technological literacy and teaching effectiveness in Taiwanese elementary schools", *Journal of Educational Technology and Society*, Vol. 15 No. 2, pp. 328-340.
- Cohen, W.M. and Levinthal, D.A. (1990), "Absorptive capacity: a new perspective on learning and innovation", *Administrative Science Quarterly*, Vol. 35, pp. 128-152.
- Correa, T., Pavez, I. and Contreras, J. (2021), "Digital inequality and mobiles: opportunities and challenges of relying on smartphones for digital inclusion in disadvantaged contexts", in Hargittai, E. (Ed.), *Handbook of Digital Inequality*, Edward Elgar, pp. 62-74.
- Crompton, H., Burke, D., Jordan, K. and Wilson, S.W. (2021), "Learning with technology during emergencies: a systematic review of K-12 education", *British Journal of Educational Technology*, Vol. 52 No. 4, pp. 1554-1575.
- DiMaggio, P. (2019), "Social stratification, life-style, social cognition, and social participation", *Social Stratification*, Routledge, New York, pp. 542-552.
- Esplin, N.L., Stewart, C. and Thurston, T.N. (2018), "Technology leadership perceptions of Utah elementary school principals", *Journal of Research on Technology in Education*, Vol. 50 No. 4, pp. 305-317.
- Fullan, M. and Quinn, J. (2015), *Coherence: the Right Drivers in Action for Schools, Districts, and Systems*, Corwin Press, Thousand Oaks.
- Gergs, H. (2003), "Economic, social, and symbolic capital", *International Studies of Management and Organization*, Vol. 33 No. 2, pp. 22-48.
- Gherheș, V., Stoian, C.E., Fărcașiu, M.A. and Stanici, M. (2021), "E-learning vs. face-to-face learning: analyzing students' preferences and behaviors", *Sustainability*, Vol. 13 No. 8, p. 4381.
- Goldthorpe, J.H. (2007), "Social class and the differentiation of employment contracts", in Goldthorpe, J.H. (Ed.), *On Sociology: Volume Two: Illustration and Retrospect*, Stanford University Press, Stanford, CA, pp. 101-124.

-
- Grissom, J.A. and Condon, L. (2021), "Leading schools and districts in times of crisis", *Educational Researcher*, Vol. 50 No. 5, pp. 315-324.
- Grooms, A. and Childs, J. (2021), "'We need to do better by kids: changing routines in U.S. schools in response to COVID-19 school closures'", *Journal of Education for Students Placed at Risk*, Vol. 26 No. 2, pp. 135-156.
- Harris, A. and Jones, M. (2021), "Leading in disruptive times: a spotlight on assessment", *School Leadership and Management*, Vol. 41 No. 3, pp. 171-174.
- Hill, C., Lamie, J. and Gore, T. (2021), *The Evolution of Transnational Education: Pathways, Globalisation and Emerging Trends*, Routledge.
- Hou, Y.W. and Cheng, K.S.Y. (2022), "Opportunities and challenges under globalization on the higher education reforms in Taiwan from 2000 to the present", in Zajda, J. and Jacob, W.J. (Eds), *Discourses of Globalisation and Higher Education Reforms. Globalisation, Comparative Education and Policy Research*, Springer, Cham, Vol. 27.
- Ignatow, G. and Robinson, L. (2017), "Pierre Bourdieu: theorizing the digital", *Information, Communication and Society*, Vol. 20 No. 7, pp. 950-966.
- Immergart, G.L. and Pilecki, F.J. (1973), *An Introduction to Systems Analysis for the Educational Administrator*, Addison-Wesley, Reading, MA.
- Johnston, A.C., Worrell, J.L., Di Gangi, P.M. and Wasko, M. (2013), "Online health communities: an assessment of the influence of participation on patient empowerment outcomes", *Information Technology and People*, Vol. 26, pp. 213-235.
- Jones, M. and Dexter, S. (2018), "Teacher perspectives on technology integration professional development: formal, informal, and independent learning activities", *Journal of Educational Multimedia and Hypermedia*, Vol. 27 No. 1, pp. 83-102.
- Kofman, F. and Senge, P.M. (1993), "Communities of commitment: the heart of learning organizations", *Organizational Dynamics*, Vol. 22 No. 2, pp. 5-23.
- Lin, N. and Erickson, B.H. (2008), "Theory, measurement, and the research enterprise on social capital", in Lin, N. and Erickson, B. (Eds), *Social Capital. An International Research Program*, Oxford University Press, Oxford, pp. 1-26.
- López-Aymes, G., Acuña, S.R. and Ordaz Villegas, G. (2020), "Resilience and creativity in teenagers with high intellectual abilities. A middle school enrichment experience in vulnerable contexts", *Sustainability*, Vol. 12 No. 18, p. 7670.
- McLeod, S. and Dulsky, S. (2021), "Resilience, reorientation, and reinvention: school leadership during the early months of the COVID-19 pandemic", *Frontiers in Education*, Vol. 6, pp. 1-13.
- McMillan, J., Goodman, S. and Schmid, B. (2016), "Illuminating 'transaction spaces' in higher education: university-community partnerships and brokering as 'boundary work'", *Journal of Higher Education Outreach and Engagement*, Vol. 20 No. 3, pp. 8-31.
- Moran, P. and Ghoshal, S. (1999), "Markets, firms, and the process of economic development", *Academy of Management Review*, Vol. 24 No. 3, pp. 390-412.
- Nahapiet, J. and Ghoshal, S. (1998), "Social capital, intellectual capital, and the organizational advantage", *Academy of Management Review*, Vol. 23 No. 2, pp. 242-266.
- Ollier-Malaterre, A., Jacobs, J.A. and Rothbard, N.P. (2019), "Technology, work, and family: digital cultural capital and boundary management", *Annual Review of Sociology*, Vol. 45 No. 1, pp. 425-447.
- Parmigiani, D., Benigno, V., Giusto, M., Silvaggio, C. and Sperandio, S. (2021), "E-inclusion: online special education in Italy during the Covid-19 pandemic", *Technology, Pedagogy and Education*, Vol. 30 No. 1, pp. 111-124.
- Peters, A. (2010), "Elements of successful mentoring of a female school leader", *Leadership and Policy in Schools*, Vol. 9 No. 1, pp. 108-129.

-
- Philipsen, B., Tondeur, J., Pareja Roblin, N., Vanslambrouck, S. and Zhu, C. (2019), "Improving teacher professional development for online and blended learning: a systematic meta-aggregative review", *Educational Technology Research and Development*, Vol. 67, pp. 1145-1174.
- Pinheiro, R. and Young, M. (2017), "The university as an adaptive resilient organization: a complex systems perspective", *Theory and Method in Higher Education Research*, Emerald Publishing Limited, Bingley, Vol. 3, pp. 119-136.
- Pinskaya, M., Kosaretsky, S., Zvyagintsev, R. and Derbshire, N. (2019), "Building resilient schools in Russia: effective policy strategies", *School Leadership and Management*, Vol. 39 No. 2, pp. 127-144.
- Pollock, K. (2020), "School leaders' work during the COVID-19 pandemic: a two-pronged approach", *International Studies in Educational Administration*, Vol. 48 No. 3, pp. 38-44.
- Purcell, J., Pearl, A. and Van Schyndel, T. (2020), "Boundary-spanning leadership among community engaged faculty: an exploratory study of faculty participating in higher education community engagement", *Engaged Scholar Journal*, Vol. 6 No. 2, pp. 1-30.
- Ragnedda, M. (2018), "Conceptualizing digital capital", *Telematics and Informatics*, Vol. 35 No. 8, pp. 2366-2375.
- Raman, A., Don, Y. and Kasim, A. (2014), "The relationship between principals' technology leadership and teachers' technology use in Malaysian secondary schools", *Asian Social Science*, Vol. 10 No. 18, pp. 30-36.
- Rawolle, S. and Lingard, B. (2013), "Bourdieu and educational research: thinking tools, relational thinking, beyond epistemological innocence", *Social Theory and Education Research*, Routledge, London, pp. 129-149.
- Richardson, J.W. and Sterrett, W.L. (2018), "District technology leadership then and now: a comparative study of district technology leadership from 2001 to 2014", *Education Administration Quarterly*, Vol. 54 No. 4, pp. 589-616.
- Saide, S. and Sheng, M.L. (2021), "Knowledge exploration–exploitation and information technology: crisis management of teaching–learning scenario in the COVID-19 outbreak", *Technology Analysis and Strategic Management*, Vol. 33 No. 8, pp. 927-942.
- Schmidt, R.C. and Richardson, M.J. (2008), "Dynamics of interpersonal coordination", in Fuchs, A. and Jirsa, V. (Eds), *Coordination: Neural, Behavioral and Social Dynamics*, Springer, Heidelberg, pp. 281-308.
- Schotter, A. (2021), "Resilient or not: boundary-spanning in innovation focused MNEs during global crises", *Critical Perspectives on International Business*, Vol. 17 No. 2, pp. 342-358.
- Seale, J.K. (2013), *E-learning and Disability in Higher Education: Accessibility Research and Practice*, Routledge, Oxford.
- Seale, J., Georgeson, J., Mamas, C. and Swain, J. (2015), "Not the right kind of 'digital capital'? An examination of the complex relationship between disabled students, their technologies and higher education institutions", *Computers and Education*, Vol. 82, pp. 118-128.
- Shaked, H. and Benoliel, P. (2022), "Instructional boundary management during COVID-19", *Educational Management Administration and Leadership*. doi: [10.1177/17411432221103678](https://doi.org/10.1177/17411432221103678).
- Sherif, K., Hoffman, J. and Thomas, B. (2006), "Can technology build organizational social capital? The case of a global IT consulting firm", *Information and Management*, Vol. 43 No. 7, pp. 795-804.
- Striepe, M. and Cunningham, C. (2022), "Gatekeepers, guides and ghosts: intermediaries impacting access to schools during COVID-19", *Ethnography and Education*, Vol. 17 No. 3, pp. 1-18.
- Subedi, S., Nayaju, S., Subedi, S., Shah, S.K. and Shah, J.M. (2020), "Impact of E-learning during COVID-19 pandemic among nursing students and teachers of Nepal", *International Journal of Science and Healthcare Research*, Vol. 5 No. 3, pp. 68-76.
- Sullanmaa, J., Pyhältö, K., Pietarinen, J. and Soini, T. (2019), "Differences in state- and district-level stakeholders' perceptions of curriculum coherence and school impact in national curriculum reform", *Journal of Educational Administration*, Vol. 57 No. 3, pp. 210-226.

-
- Sutherland, L.A. and Burton, R.J. (2011), "Good farmers, good neighbours? The role of cultural capital in social capital development in a Scottish farming community", *Sociologia Ruralis*, Vol. 51 No. 3, pp. 238-255.
- Sy, M.P., Park, V., Nagraj, S., Power, A. and Herath, C. (2022), "Emergency remote teaching for interprofessional education during COVID-19: student experiences", *British Journal of Midwifery*, Vol. 30 No. 1, pp. 47-55.
- Taylor, F.W. (1911), *Principles of Scientific Management*, Harper, New York.
- Thompson, J.D. (1967), *Organizations in Action*, McGraw-Hill, New York.
- Torres, A.I., Ferraz, S.S. and Santos-Rodrigues, H. (2018), "The impact of knowledge management factors in organizational sustainable competitive advantage", *Journal of Intellectual Capital*, Vol. 19 No. 2, pp. 453-472.
- Turkina, E. and Thai, M.T.T. (2013), "Social capital, networks, trust and immigrant entrepreneurship: a cross-country analysis", *Journal of Enterprising Communities: People and Places in the Global Economy*, Vol. 7, pp. 108-124.
- Tushman, M.L. and Scanlan, T.J. (1981), "Boundary spanning individuals: their role in information transfer and their antecedents", *Academy of Management Journal*, Vol. 24 No. 2, pp. 289-305.
- Uhlhaas, P., Pipa, G., Lima, B., Melloni, L., Neuenschwander, S., Nikolić, D. and Singer, W. (2009), "Neural synchrony in cortical networks: history, concept and current status", *Frontiers in Integrative Neuroscience*, Vol. 3, pp. 1-19.
- UNESCO (2021), *The Global Education Coalition in Action*, UNESCO, Paris.
- Valli, L., Stefanski, A. and Jacobson, R. (2018), "School-community partnership models: implications for leadership", *International Journal of Leadership in Education*, Vol. 21 No. 1, pp. 31-49.
- Van Deursen, A.J. and Van Dijk, J.A. (2014), *Digital Skills: Unlocking the Information Society*, Springer, Palgrave Macmillan New York.
- Vogus, T.J. and Sutcliffe, K.M. (2007), "Organizational resilience: towards a theory and research agenda", *2007 IEEE international conference on systems, man and cybernetics*, IEEE, pp. 3418-3422.
- Waddell, J. and Żochowski, M. (2006), "Network reorganization driven by temporal interdependence of its elements", *Chaos*, Vol. 16, 023106.
- Walton, P. (2015), "Digital information and value", *Information*, Vol. 6 No. 4, pp. 733-749.
- Williamson, B., Eynon, R. and Potter, J. (2020), "Pandemic politics, pedagogies and practices: digital technologies and distance education during the coronavirus emergency", *Learning, Media and Technology*, Vol. 45 No. 2, pp. 107-114.
- Zajda, J. and Rust, V. (2021), *Globalisation and Comparative Education: Changing Paradigms*, Springer Nature, Dordrecht, Vol. 24.
- Zhang, S., Wang, X. and Zhang, B. (2021), "The policy effects of innovative city pilot on the dual efficiency of industry–university–research knowledge flow", *Technology Analysis and Strategic Management*, Vol. 34 No. 9, pp. 1-12.
- Ziembowicz, M., Nowak, A. and Winkielman, P. (2013), "When sounds look right and images sound correct: cross-modal coherence enhances claims of pattern presence", *Cognition*, Vol. 129, pp. 273-278.
- Zimmerman, F.J. and Anderson, N.W. (2021), "Association of the timing of school closings and behavioral changes with the evolution of the coronavirus disease 2019 pandemic in the US", *JAMA Pediatrics*, Vol. 175 No. 5, pp. 501-509.

Further reading

- Levinthal, D.A. and March, G. (1993), "The myopia of learning", *Strategic Management Journal*, Vol. 14 No. S2, pp. 95-112.

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