



9-2016

What Can Be Learned from Small (and Micro) States? 'Educational Geostrategic Leveraging' and the Mechanisms of the Fourth Industrial Revolution – the Internet of Things and Disruptive Innovation

Tavis D. Jules

Loyola University Chicago, tjules@luc.edu

Patrick Ressler

Recommended Citation

Jules, Tavis D. and Ressler, Patrick. What Can Be Learned from Small (and Micro) States? 'Educational Geostrategic Leveraging' and the Mechanisms of the Fourth Industrial Revolution – the Internet of Things and Disruptive Innovation. *Island Studies Indian Ocean / Océan Indien*, 3, 1: 27-35, 2016. Retrieved from Loyola eCommons, School of Education: Faculty Publications and Other Works,

This Article is brought to you for free and open access by the Faculty Publications at Loyola eCommons. It has been accepted for inclusion in School of Education: Faculty Publications and Other Works by an authorized administrator of Loyola eCommons. For more information, please contact ecommons@luc.edu.



This work is licensed under a [Creative Commons Attribution-Noncommercial-No Derivative Works 3.0 License](https://creativecommons.org/licenses/by-nc-nd/3.0/).

© University of Seychelles, 2016.

SIDS Educational Research

WHAT CAN BE LEARNED FROM SMALL (AND MICRO) STATES? 'EDUCATIONAL GEOSTRATEGIC LEVERAGING' AND THE MECHANISMS OF THE FOURTH INDUSTRIAL REVOLUTION — THE INTERNET OF THINGS AND DISRUPTIVE INNOVATION

Key words: SIDS, vulnerability, strategic level bargain & cooperation

Tavis D. Jules and Patrick Ressler

● Abstract

This paper explores how certain global mechanisms of the so-called fourth industrial revolution – the internet of things and disruptive innovation – impact the educational governance activities, social forms of coordination, and scales in small (and micro) states. We advance that there are certain 'behavioral characteristics' that small (and micro) states possess that can teach us about dealing with some of the current global challenges. We suggest to move away from seeing small (and micro) states as being exclusively vulnerable and, rather, to re-conceptualize smallness as a potential strength. In line with this argument, we argue that the geometries of vulnerability are giving rise to what we call educational geostrategic leveraging, i.e. the use of soft power grounded in strategic-level bargain and cooperation at the national level to achieve regional consensus. It is in this context that we suggest that educational geostrategic leveraging is emerging as a component of collaboration and cooperation at the regional and other levels.

This paper has three sections that seek to explore how certain global mechanisms impact educational governance activities, social forms of coordination, and scales in small open economies, small (and micro) states and small islands developing states (SIDS) – terms that are often used interchangeably – and how these states respond to these mechanisms. By educational governance activities we mean e.g. the funding, provision, regulation, and ownership of education; social forms of coordination particularly implying the state, the market, the community, and the family; and scale refers to the supranational, national, regional and subnational levels in the field of education (Dale, 1997; 2005).

In this paper, we do not view state size as a monolithic category. Instead we suggest that current global developments in the realm of education in the wake of the so-called fourth industrial revolution apply to small (and micro) and to non-small states alike. Here the professed fourth industrial revolution implies the amalgamation of technologies across several fields – such as health, transport, and education – that blur the lines between reality and cyberspace in an era premised upon high technology and a demand economy. We advance that there are certain 'behavioral characteristics' that small (and micro) states possess that they can teach us about dealing with some of the policy challenges of the fourth industrial revolution. In making these assumptions, we draw upon the concept of "mechanisms of external policy influence" (Dale, 1999) to explain how fourth industrial revolution mechanisms are reshaping the broader social, economic and cultural context of the "politics of education," (Dale, 1998), thus giving rise to particular education policies. Given the historical assumptions found in robust literature on educational

developments in small (and micro) states and mechanisms of external effects driven by a changing global environment, we seek to understand if there is something like 'typical small state' behavior in education.

In particular, we are suggesting that small states rely upon their strategic capacities to act rather 'big' in certain areas, while 'big' states often act rather 'small.' We are also advocating that this way of thinking expands our understanding of the characteristics of small states – and by implication of 'big' states as well –, especially regarding what is general and what is particular about their 'behavior.' Prevailing definitions of small (and micro) states are often based on 'hard' formal criteria like population size and economic performance, etc. We argue that alternative definitions are now needed for conceptualizing the behaviors of small (and micro) states. Such definitions have to operate with 'soft' criteria, such as collective self-perceptions, external attributions, and others that do not treat states as homogeneous entities based on formalistic criteria. Thus, states that are 'big' by 'hard' formal criteria may behave rather 'small,' while small states (again by 'hard' formal criteria) may act rather 'big.' Thus, widening conventional notions of smallness expand our scope for comparison as well as our understanding of both small and big states – especially regarding what is general and what is particular about their 'behavior.'

In what follows, we first contextualize the changing geometries of the movement towards the fourth industrial revolution premised upon horizontal coordination that are now increasingly shaping the governance of national education systems. Second, we will redraw the geometries of the existing research on small (and micro) states in a global environment that is being strategically realigned, influenced by e.g. the rise of state-capitalism in China, cross-

SIDS Educational Research

hemispherical affairs, and the pausing of economic globalization or what has been called the “gated global” (Economist, 2013; Jules, 2015a), as countries retreat to protectionist policies. We suggest to move away from seeing small (and micro) states as being exclusively vulnerable and, rather, to re-conceptualize smallness as a potential strength. Finally, we explore how small (and micro) states in reconfiguring the geometries of vulnerability are giving rise to what we call educational geostrategic leveraging, i.e. the use of soft power grounded in strategic-level bargain and cooperation at the national level to achieve regional consensus. We conclude by suggesting that research needs to emerge on small (and micro) states that warrants new conceptual and methodological approaches that move away from the vulnerability trap and highlight the strengths of small (and micro) states.

New Geometric Mechanisms in Education

Conceptualizing the mechanisms of external policy influence, Dale (1999) makes a distinction between certain conventional mechanisms (e.g. policy borrowing and policy learning) and new mechanisms (e.g. teaching, harmonization, dissemination, standardization, installing interdependence, and imposition) while still cautioning that both categories may work simultaneously in shaping education policy. However, we draw attention to the disruptive nature of globalization upon national education systems: While mechanisms may affect several aspects of national educational systems, they do not necessarily lead to the “identical imposition of the same policy on all countries” (p. 2). Dale (1999) further suggests that since mechanisms

are not unbiased, it is important to identify the particular effects of each mechanism on particular national education systems. This particularly true in the case of small (and micro) states, as these states mostly have an extensive history of dealing with external pressures that is often tied to their geographic or economic size.

The transition from the knowledge-based economy to the fourth industrial revolution or what is often called “capitalism 3.0” (Barns, 2006) or “globalization 3.0” (Friedman, 2005) is reshaping the mechanisms of external effects, which are in turn influencing the dynamics of national labor markets and the scalar division of labor of educational governance. At the recently concluded World Economic Forum, Schwab (2016) in discussing the rise of the fourth industrial revolution reminds us that the first industrial revolution, in the late 18th century, was driven by mechanized production and powered by water and steam. The second industrial revolution, one hundred years later, relied inter alia upon the division of labor and used electric power to facilitate mass production. Again one hundred years later, the third industrial revolution automated production through electronics and information technology. Now, the fourth industrial revolution expands upon the digital revolution of the third industrial revolution by using cyber-physical systems that blur the lines between the physical, digital, and biological spheres. As such, the fourth industrial revolution and its ensuing mechanisms have the potential to revolutionize national education systems for good or for worse.

The fourth industrial revolution suggests that in education we might see new “mechanisms of ‘parallel organization,’ operating on the basis of

● Résumé

Cette communication est axée sur la façon dont certains mécanismes globaux de ce que l’on nomme la quatrième révolution industrielle – l’internet des objets et l’innovation de rupture – ont un impact sur les activités liées à la gestion de l’éducation, sur les formes sociales de coordination, et les échelles dans les petits et micro-Etats. Nous défendons la proposition que certaines des caractéristiques comportementales des petits et micro-Etats peuvent nous aider à faire face à certains défis contemporains sur le plan mondial. Nous suggérons un renoncement de la vision selon laquelle les petits et micro-Etats ne peuvent être que vulnérables. A la place, nous proposons une conceptualisation nouvelle de la notion d’étroitesse territoriale comme en tant que force éventuelle. Dans ce même ordre d’idées, nous affirmons que les géométries de la vulnérabilité sont en train de donner lieu à ce que l’on nomme les bénéfices géostratégiques en matière d’éducation, c.-à.-d. l’utilisation du pouvoir discret ancré dans la négociation stratégique et la coopération au niveau national en vue d’obtenir le consensus régional. C’est dans un tel contexte que nous suggérons que les bénéfices géostratégiques en matière d’éducation pourraient surgir en tant qu’élément de collaboration et de coopération au niveau régional et au-delà.

multilevel consensus, often functioning side-by-side with traditional [educational] bureaucracy” (Heckscher & Applegate, 1994, p. 2). The two mechanisms of external effects of the fourth industrial revolution that are likely to impact national education developments particularly are: (i) “disruptive innovation” (Christensen, 2013), i.e. the displacement of historical static systems, and (ii) the “Internet of Things” (Ashton, 2009),² i.e. the movement away from human-to-human or human-to-computer interaction (Abu Mezied, 2016; Schwab, 2016). In essence, fourth industrial revolution mechanisms are obviously slowly

Notes

1. Friedman (2005) argues that globalization 1.0 commenced with the opening of trade routes between ‘old’ and ‘new worlds from the fifteenth-century to the nineteenth-century. Globalization 2.0, although interrupted by the great depression and two World Wars, is dated from turn of nineteenth-century to the end of the millennium.

2. In 1999 Kevin Ashton coined the term Internet of Things to explain a new type of internet whereby we “empower computers with their own means of gathering information, so they can see, here and smell the world for themselves, in all its random glory” (Ashton, 2009, p. 1). While the European Union embraced the concept in 2009 with the creation of the European Internet of Things Research Cluster (IERC), it was not until the creation of the digital single market in 2015 that the concept gained wider recognition.

dislodging Dale's (1999) mechanisms of external effects – i.e. policy harmonization, dissemination, standardization, installing interdependence, and imposition – since they are becoming part of the 'orthodoxy' as educational systems are increasingly responding to changing dynamics of globalization. However, fourth industrial revolution mechanisms are working simultaneously with the older mechanisms, posited by Dale (1999), in shaping national developments in education policymaking. In light of the arrival of fourth industrial revolution mechanisms, there are lessons to be learned from how small (and micro) states have dealt with the earlier mechanisms posed by globalization.

We challenge orthodox 'vulnerability assumptions' made about the behavior of small (and micro) states and argue that small (and micro) states should be treated with much more discretion. Small (and micro) states should much more than hitherto be viewed as having strengths rather than exclusively in terms of their vulnerability. In 2015, for example, certain small (and micro) states were consigned to the frontline leading up to the signing of the Sustainable Development Goals. As usual, global attention was given to their 'special vulnerabilities' – given that they have historically been disproportionately challenged for sustainable development related to their geography, small size, and physical isolation (Cohen, Hermosilla, Espinel, & McLean, 2016; Soobratty, 2015; Veenendaal & Wolf, 2016) – while little or no attention was placed upon 'what can be learned from small (and micro) states' in a changing global environment driven by complex interdependence and disruptive innovation.

Re-(drawing) the Geometries of the Vulnerability Trap

The characteristics of small state behavior have been a neglected area of research in education practically during both 'first and second generation studies' (Jules & Ressler, forthcoming). On the one hand, small (and micro) states are more visible today on the international stage due to their perceived vulnerability. On the other hand, they are mostly categorized collectively as potential

recipients for 'one size fits all' global policies. 'First generation studies' on educational developments in small

'Second generation studies' usually begin by identifying the strategic capacities of smallness.

(and micro) states have generally focused on the challenges these states face, chiefly underscoring numerous formulaic criteria: size, population, economic capacity, geographic propensity, autonomous jurisdiction, ecology, and others. These studies grew out of a focus on understanding how the perceived vulnerability and fragility of many small (and micro) states impact political and economic decisions (Briguglio, 1995; Bune, 1987; Demas, 1965; Kuznets, 1960; Holmes, 1976). In drawing attention to the perceived 'behavioral' characteristics of smallness, many of these studies illuminate scalar dynamics of smallness by drawing attention to "exaggerated personalism, limited resources, inadequate service delivery and donor dependence" (Sutton, 2006, p. 13) to explain the informal relationships and structures and the multi-functionalism smallness – implying that one person holds several different functions (see Christensen, 2013).

'Second generation studies' usually begin by identifying the strategic capacities of smallness, while at the same time recognizing the consequences of the fragilities and vulnerabilities many small (and micro) states indeed display. Attention is given to analyzing the self-projections of small states, particularly when this self-projection provides greater diplomatic leverage (Baldacchino, 2000). In fact, the public administration literature makes no distinction between big and small. However, a lot has been written about the strategic capacity of small (and micro) states and that they "typically reflect derivations of the Weberian model [...] and its principles exhibit adaptations in features like greater personalism, less lourdeur administrative and more informal policy co-ordination" (Connaughton, 2010, p. 111). However, this

'deficit discourse' is premised upon the perceived inability of many small (and micro) states to develop specialized institutions (Baldacchino, 2012; Jules 2012a). Also, several authors have identified that small size (economically or geographically) may also provide advantages, such as strategic flexibility (Baldacchino & Bertram, 2009) or the development of economies of scale that outperform centennial countries (Armstrong, de Kervenoael, Li, & Read, 1998). Other authors, recognizing the advantages that small (and micro) states can leverage to accomplish reforms that bureaucratic behemoths of big states dream of doing, suggest moving away from a deficit view: "[S]mall (and micro) states have been rendered synonymous to chronically vulnerable and problematic territories for which aid, assistance and especially favourable deals are legitimate" (Baldacchino, 2012, p. 237). Instead, Jules (2012) suggests moving towards a "posteriori conceptualization [of smallness that focuses] on what it means to empirically study small (and micro) states rather than what it means to be identified as a small state" (p. 7). Second generation studies do not pigeonhole their analysis to nominal concepts, hard criteria, and the perceived handicaps of small states. The realization is that smallness may be both an asset and a liability of the changing nature and the role of the nation state, especially in emerging and frontier markets, and in the advancement of new hemispherical and regional players, such as custom unions, regional trade agreements and "trans-regional regimes" (Jules, 2008). The new realities, state reconstruction and hemispherical assemblages are becoming ever more important, as "globalization fosters intra- and inter-regional cooperation as it redistributes the importance to regions" (Reiterer, 2009, p. 181).

Moreover, small (and micro) states do not always fit well within the global development targets spelled out e.g. in the Jomtien Framework, the Dakar Framework for Action, and the Millennium Development Goals (MDGs) that dominated the policy cycles of the 1990s and 2000s as well as the recently signed Sustainable Development Goals. This is, however, not necessarily their 'fault,' for global education targets are often too reductionist and

SIDS Educational Research

unspecific to match the particular situation of individual countries. Furthermore, educational research often ignores the vast differences between individual countries. This particularly applies to small (and micro) states where – based on purely formal criteria – rather diverse states are often indiscriminately lumped together. The application of the ‘vulnerability paradigm’ to study educational development in small (and micro) states has also rendered educational actors powerless and attributed reforms and agenda-settings attitudes to ‘international knowledge banks’ (Jones, 2004). There is a rigorous body of literature on educational development in small (and micro) that suggests that external actors are responsible for the ‘uncritical international transfer’ of programs, policies and practices in these countries, given the lack of institutional capacity and aid dependence (Brooks & Crossley, 2013; Crossley, 1984; 1999; Crosley, Bray, Packer, & Sprague, 2011; Jules, 2015b; Holmes & Crossley, 2004; Lam, 2010; Louisy, 2001). In fact, research about educational developments in small (and micro) states displays a certain ‘empirical cliff.’ for example, while there is a growing interest in why some of the many states categorized as small are more successful in coping with the challenges of globalization than others, there is diminishing empirical research about what actually constitutes ‘success’ (Jules, 2012; Jules & Ressler, forthcoming). In fact, across many disciplines – public administration (Connaughton, 2010), tourism (Bojanic & Lo, 2016), political science (Veenendaal & Wolf, 2016), institutional analysis (Oppong, 2016), and education (Jules, 2012) – the strategic capacities of small (and micro) states are not studied, as research continues to emphasize the fragility paradigm small (and micro) states have been relegated to. As Veenendaal and Wolf (2016) argue, habitually small (and micro) states “are often not considered to be ‘real’ states” (p. 279). Along this line, Baldacchino and Bertram (2009) suggest that “the survival into the modern era of a large number of successful small (and micro) states[...] is evidence [...] not of weakness but of underlying elements of strength that are inherent in small, often island, societies” (p. 142). Other authors have shed light on the multi-dimensionality of the resilience of small (and micro) states by asserting that many

of these states are strategic innovators in battling their perceived faith of vulnerability and fragility (Easter, 1999; Guillaumont, 2010; Philpot, Gray, & Stead, 2015). In fact, it is widely acknowledged that “‘islandness’ [or land lockedness] has virtually no impact on the economic performance of microstates [...] and the early pessimistic tone of much of the research literature has now receded” (Armstrong & Read, 2000, pp. 288-289). In line with these arguments, we suggest that many small (and micro) states are using their strategic capacity in the form of ‘geostrategic thinking,’ i.e. they tactically use their smallness when it provides strategic leverage, particularly in the area of educational cooperation.

Re-(framing) Spatial Geometries in an Era of Horizontal Coordination

Disruptive innovation and the Internet of Things (IoT) are considered the two most influential mechanisms of external effects of the fourth industrial revolution by many. Both of these emerging mechanisms are likely to reshape the fundamental dynamics of national educational developments in the coming decades. While we are not in the position to foresee their potential consequences, given their emergent nature, we discuss their ascendancy in the context of how certain small (and micro) states have responded in the past to “existential threats” (Girvan, 2010), ranging from climate change and transnational crime to food security and governance challenges.

First, complex interdependence has emerged as certain challenges to national education systems and sectors have occurred, an interdependence that renders issues in the global governance architecture progressively vivacious. This was part of the horizontal realignment of state reforms during the 1980s when new public management (NPM) and two generations of neoliberalism profoundly transformed national education systems globally. These reforms have given way to the post-bureaucratic state that is premised upon a vanishing scale, size, and space through novel regulatory instruments of coordination (Jules, 2012; Maroy, 2012; Pons & van Zanten, 2007). The evolution towards post-bureaucratic

governance in education suggests that: (i) the Weberian legal-rational model, which advocates formal organizational structures and mechanisms, is declining, and (ii) there is a tendency towards regional institutional mechanisms steeped in collaboration, cooperation, diplomacy, and implementation (Jules, 2016). The shift towards transnational modules of governance suggests that the state now “defines objectives and oversees maintenance of the system management [...] [and] no longer wants to be seen as the sole provider of legitimate instruction” (Maroy, 2009, p. 78). Additionally, the internationalization in educational services, which is one out of twelve core service sectors under the General Agreement of Trade in Services (GATS), has created new promises and challenges for educational diplomacy.

Second, there is growing consensus that economic globalization has ‘paused’ owing to the proliferation of regional trading agreements (RTA) and tendencies towards an innovative form of protectionism. As Kjellén (2008) suggests, “we have entered a new era of international cooperation and [...] the boundaries of traditional diplomacy – concentrated on national security and economic and commercial matters – are being extended to a much broader concern for global sustainability” (p. 2). It is within this changing geo-strategic global climate that educational development in small (and micro) states is caught in the middle of the shift from established asymmetrical power relationships of center-periphery models to a different kind of multi-polarity that is denominated by non-traditional actors that play an increasingly prominent role alongside nation-states in determining national education priorities. An interesting example of this far-reaching development is the shift from “inter-regionalism,” i.e. the relationship between two separate regions, to “trans-regionalism,” i.e. common ‘spaces’ between and across regions in which constituent agents (e.g. individuals, communities, organizations) interact within (Dent, 2003). This happens as trade relations move away from “old” or “closed regionalism,” which is premised upon intra-regional and bilateral trade, to “new” or “open regionalism,” which

advocates internationally competitive outward-oriented strategies (Kuwayama, 1999; McBrian, 2001), reduces external import barriers (Wei & Frankel, 1995), decreases intra-regional transactional costs (Fernandez, 1997; Reynolds, 1997), liberalizes intra-regional markets (Kuwayama, 1999), and restructures the public sector (Sutton 2006; Bishop & Payne, 2010), amongst other things. Moreover, to facilitate the growth of “new regionalism,” there is now a trend towards creating “formal mechanisms” (Dale, 1999) to deal with transaction costs. Transaction costs refer to all resources that are spent in negotiation efforts, including time, personnel, money, prestige, and even power (Jules & Sa e Silvia, 2008). Overall, the regional level now has the role of providing “coordination of coordination of funding, provision and regulation of education” (Dale, 2009, p. 11) through policy exchange at the multi-governance level.

Third, the dynamics of emergent technological innovations in an era of increased competition are giving rise to rapid changes in fields such as artificial intelligence, robotics, autonomous vehicles, 3-D printing, nanotechnology, biotechnology, materials science, energy storage, and quantum computing. These innovations are also reshaping education through disruptive innovation—e.g. the utilizing of interconnected computing devices, mechanical and digital machines, objects, animals or people – and the Internet of Things. On the one hand, disruptive innovation is reshaping how businesses and other organizations function. Unlike sustaining innovation, which focuses on improving existing products, disruptive innovation creates innovative markets and products and reshapes entire industries, as occurred e.g. with television (Netflix), hotel (Airbnb), classified ads (Craigslist), phone

calls (Skype), record stores (iTunes), research libraries (Google), local stores (eBay), taxis (Uber), and newspapers (Twitter) (see Economist, 2015). As

Numerous analysts argue that the IoT will bring vast societal changes and economic growth driven by the “ubiquitous connectivity and intelligence

Christensen, Horn, Caldera, and Soares (2011) note, “[Disruptive education] is the process by which a sector that has previously served only a limited few because its products and services were complicated, expensive and inaccessible, is transformed into one whose products and services are simple, affordable, and convenient and serves many no matter their wealth or expertise.” (p. 2)

Disruptive innovation is also making its ways into higher education, where it is for e.g. redefining traditional ways in which universities deliver content, curriculum, and teaching and gradually replacing them with new alternatives (Dennis, 2016; Robinson, Morgan, & Reed, 2016; Thompson, 2016). On the other hand, the Internet of Things (IoT), where ‘things’ are wirelessly connected via smart sensors (Ashton, 2009; Pretz, 2013), is a relatively new phenomenon that has expanded in several sectors, ranging from transportation and healthcare to the automotive industries (He, Yan, G, & Xu 2014; Joshi & Kim, 2013; Li, Xu, & Zhao, 2015; Pretz, 2013). Li, Xu, and Zhao (2015) argue that “the words ‘Internet’ and ‘Things’ mean an inter-

connected world-wide network based on sensory, communication, networking, and information processing technologies, which might be the new version of information and communications technology (ICT)” (p. 244). Numerous analysts argue that the IoT will bring vast societal changes and economic growth driven by the “ubiquitous connectivity and intelligence, where a set of components, products, service and platforms connects, virtualizes and integrates everything in a communication network for digital processing” (Friess & Riemenschneider, 2014, pp. 5-6), which in turn will connect people’s professional and private lives. It is the connectability and the harnessing of services across the IoT that are likely to greatly impact national educational developments as well. With the liberalizing and commercializing of all kinds of educational services under the so-called four modes of supply³ of the General Agreement on Trade in Services (GATS), which “rearticulate the nature and form of education and its governance through [...] to make education systems and education provision within nation-states more amenable to a global accumulation strategy” (Robertson, Bonal, & Dale, 2002, p. 479), national systems are likely to increasingly become susceptible to the IoT. In commenting on the damage done in the wake of liberalizing education in small (and micro) states, Mayo, Pace, and Zammit (2008) suggest that distance learning “with its flexibility, individually tailored programmes and liability for yet another form of cultural invasion, occupies the space left vacant because of the non-existence of universities (potential providers of extension learning services and continuing education) in many small states” (p. 223). It is known that the IoT creates an “open, global network connecting people, data,

Note

3. The four modes of supply are: (i) Cross-border supply: provision of education services at a distance, such as e-learning or in other distance learning programs; (ii) consumption abroad: the consumer (in education the student) travels to another country to access the service; (iii) commercial presence: the service company (university) sets up a subsidiary abroad, such as a branch campus; (iv) presence of natural persons: one person (education professional, researcher, consultant or teacher) travels and provides a service in another country.

SIDS Educational Research

and things” through the “use of synergies that are generated by the convergence of Consumer, Business and Industrial Internet” (Vermesan, et al., 2014, p. 17). In education, the IoT has already given rise to new forms of interaction between teachers and students, e.g. by expanding teaching and learning processes and broadening the environments in which students learn (Marquez, Villanueva, Solarte, & Garcia, 2016). Thus, in education, the IoT implies a movement towards a “new ecology, [that will be] transformed by everything being connected” (Manu, 2015, p. 6).

In education, an ever increasing datafication (Ozga, 2009, Resnik, 2016) of policymaking decisions – c.f. ‘evidence-based’ and ‘evaluative state’ models that rely on league tables, rankings, and other international comparative target achievements (ICTAs) (Meyer & Benavot, 2013) –⁴ is expanding the “global education industry” by allowing new non-state actors to compete (Ball, 2012; Jules, forthcoming; Steiner-Khamsi, 2016). These new non-state actors (e.g. transnational corporations, civil society organizations, credit rating agencies, consultancies, and public-private partnerships) are changing the governance environment as they are increasingly contracted to deliver educational services and educational governance that were once provided by the state. Within this new educational reality, there is also a movement away from the development of certain skills for a knowledge-based economy towards credentialization, i.e. the earning of degrees to advance in the job market. Given the transformation of the delivery modes of education, education systems today are expected to be ‘testbeds for innovation.’ For example, in higher education, the rise of Massive Open Online Courses (MOOCs) – a term that was coined in 2008 to describe

the pedagogical modes of Connectivism and Connective Knowledge (CCK) – is often replacing traditional “place-based” teaching modes (Abu Meziad, 2016). The rapid rise of MOOCs has not only created new business models and new markets for providers of higher education. While studying the impact of new mechanisms of external effects is a relatively new field of inquiry in Comparative and International Education, there is growing consensus that these new mechanisms are the new game changers, particularly given the rise of non-state actors in education.

Re-(configuring) Geometries for Small (and micro) states – Educational Geostrategic Leveraging

Small (and micro) states rely upon their strategic capacities to act rather big in certain areas, while big states often act rather small. Such capacities can e.g. be found in areas such as health and education coordination in the small (and micro) states of the Caribbean Community (CARICOM). For example, Jules (2012) shows that CARICOM countries in responding to HIV/AIDS, use the mechanisms of policy transfer to invoke

- [...] new mutualism – that is a policy reaction in the form of a multi-sectoral approach, international target setting, and regional benchmarks [...] [as a way of] providing a coordinated regional response to the epidemic, but also a way to engage in building a new regional educational space in the form of the [Caribbean Educational Policy Space] through mitigation of transactional costs, sharing

of policy best practices and techniques, and dissemination of information. (p. 278)

Such a coordinated response to external effects highlights two things. First, the era of uncritical international policy transfer that was a core characteristic of the 1980s and 1990s in small and (micro states) is declining. This decline speaks to the movement from education politics – how actors define the field of education and ensure policies that are designed – to the politics of education – focusing on how the broader social, economic and cultural context produces particular state politics and education policies (Dale 1998). This implies that in education, small state behavior is atypical and often invoked during times of crisis. Thus, transformations in the global system simply play into the normative comparative advantages that small (and micro) states have, that is, the ability to leverage their bureaucratic and institutional flexibility. Many small states are therefore able to adapt better to endogenous and exogenous changes than many bigger states. In a changing global environment, many small (and micro) states are using their competitive strengths to mobilize the ‘politics of scale’ to diversify their post-colonial monocultural economies of scale by attracting investments from state-owned Chinese conglomerates. A behavioral characteristic of many small (and micro) states is their growing ability to develop resilience to perceived global threats and shocks. In this way, we are able to see how certain external effects create alternative forms of educational cooperation or “educational diplomacy” (Jules, 2016) grounded in soft power. The idea of ‘geostrategic thinking’ and ‘geostrategic leveraging’ by small (and micro) states is not at all new, but only now

Note

4. These include International Evaluation of Educational Achievement (IEA); International Adult Literacy Survey (IALS); Programme for International Student Assessment (PISA); Programme for the International Assessment of Adult Competencies (PIAAC); Progress in International Reading Literacy Study (PIRLS); Global Monitoring Report (GMR); First International Mathematics Study (FIMS); Second International Mathematics Study (SIMS); Trends in International Mathematics and Science Study (TIMMS); and Teaching and Learning International Survey (TALIS).

is it spilling over to educational research. Another example of geostrategic thinking is how the proliferation of international law and intergovernmental institutions provides small (and micro) states with choices concerning the actors they want to work with, rather than having global lenders and donors impose these actors upon them (Geser, 1992; Hoffman, 2016).

Second, these new cooperative and collaborative endeavors within small (and micro) states in education are fostered in what we call educational geostrategic leveraging. It is grounded in strategic-level bargain and cooperation at the national level to achieve regional consensus and a facet of gated regionalism – i.e. the return to protectionist policies – to respond to protracted global governance. As the

global architecture is being restructured with the return to protectionist policies at various levels (energized e.g. by the global recession, the so-called refugee crisis in European, sluggish growth in China, and an expansion of transnational terrorism), and the arrival of the fourth industrial revolution, many small (and micro) states are responding in unique ways. Not only is educational geostrategic leveraging built around a strategic capacity found in small states, but it is also driven by the mechanisms of external effects that are reshaping the global level. Educational geostrategic leveraging is built around networks of coordination and collaboration in that it is a “process-oriented mode of policy-making [that] amounts to a more structural mode of exerting influence since

it allows in principle for the simultaneous extension of regulatory and organizational boundaries.” (Rhodes, 1997, p. 15). It is in this context that we suggest that educational geostrategic leveraging is emerging as a component of collaboration and cooperation at the regional and other levels. Educational geostrategic leveraging creates new horizontal spaces that operate within the unique contours small (and micro) states function within. In education, new innovations are changing traditional geometries of educational governance. Therefore, the fourth industrial revolution mechanisms provide us with the opportunity to better understand how small (and micro) states have responded to previous external threats and to reflect on what this means for our understanding of big states.

References

- Armstrong, H., de Kervenoael, R. J., Li, X., & Read, R. (1998). A comparison of the economic performance of different micro-states, and between micro-states and larger countries, *World Development*, 26(4), 639-656.
- Armstrong, H.W., & Read, R. (2000). Comparing the economic performance of dependent territories and sovereign microstates. *Economic Development and Culture Change*, 48(2), 285-306.
- Ashton, K. “That ‘Internet of Things’ Thing”. In: *RFID Journal*, 22 July 2009; Available online: <http://www.rfidjournal.com/articles/view?4986>, retrieved by 16 May 2016.
- Baldacchino, G. (2000). The challenge of hypothermia a six-proposition manifesto for small Island territories. *The Round Table*, 1(353), 65–79. Retrieved from <http://www.tandfonline.com/doi/abs/10.1080/750459455>
- Baldacchino, G., & Bertram, G. (2009). The beak of the finch: Insights into the economic development of small economies. *The Round Table*, 98, 401.
- Ball, Stephen J. (2012). *Global Education Inc: New Policy Networks and the Neo-liberal Imaginary*.
- Bishop, M., L. & Payne, A. (2010, February). Caribbean regional governance and the sovereignty/statehood problem *Bune, P. (1987). Vulnerability. The Courier* 4, 85-87.
- Bojanic, D. C., & Lo, M. (2016). A comparison of the moderating effect of tourism reliance on the economic development for islands and other countries. *Tourism Management*, 53, 207-214.
- Briguglio, L. (1995). Small island developing states and their economic vulnerabilities. *World Development*, 23, 1615-1632
- Bune, P. (1987). *Vulnerability, The Courier*, 4, 85-87.
- Christensen, C. (2013). *The innovator’s dilemma: when new technologies cause great firms to fail*. Harvard Business Review Press.
- Christensen, C. M., Horn, M. B., Caldera, L., & Soares, L. (2011). *Disrupting College: How Disruptive Innovation Can Deliver Quality and Affordability to Postsecondary Education*. Innosight Institute.
- Connaughton, B. (2010). “Symptom or Remedy? Mediating Characteristics of the Irish Central Bureaucracy and their Influence on the Strategic Capacity of a “Small” State.” *Halduskultuur – Administrative Culture* 11 (1), 110-126.
- Crossley, M. (1984). “Strategies for Curriculum Change and the Question of International Transfer.” *Journal of Curriculum Studies* 16 (1): 75–88. doi:10.1080/0022027840160109.
- Crossley, M. Bray, M. and Packer, S. (2011). *Education in Small States: Policies and Priorities*. London, UK: The Commonwealth Secretariat.
- Dale, R. (1999). Specifying globalization effects on national policy: a focus on the mechanisms. *Journal of Education Policy*, 14(1), 1–17. <http://doi.org/10.1080/026809399286468>
- Dale, R. 2009. “Introduction.” In *Globalisation and Europeanisation in Education*, edited by R. Dale and S. Robertson, 7?19. Oxford: Symposium Books
- Demas, W. G. (1965). *The economics of development in small countries with special reference to the Caribbean*. Montreal, Canada: McGill University Press.
- Dennis, M. J. (2016). *The future of higher education is now. Enrollment Management Report*, 19(11), 1-3.
- Easter, C. (1999). *Small (and micro) states development: A Commonwealth Vulnerability Index. The Round Table: Commonwealth Journal of International Affairs*, 88(351), 403-

SIDS Educational Research

References

- 422.
- Economist. (2015). What disruptive innovation means. Retrieved May 14, 2016, Available online:<http://www.economist.com/blogs/economist-explains/2015/01/economist-explains-15> (accessed 17 May 2016).
- Economist. (2013). The World Economy: The Gated Globe. Available online: <http://www.economist.com/news/leaders/21587785-gated-globe> (accessed 17 May 2016).
- Fernandez, R. (1997). Returns to regionalism: An evaluation of non traditional gains from regional trade agreements Policy research working paper Number.1816. New York, NY: World Bank (IED).
- Friess, P., Riemenschneider, R. (2014). New horizons for the internet of things in Europe. Internet of things beyond the hype: Research, innovation and deployment. In Vermesan, & P. Friess, (Eds.). Internet of Things-From research and innovation to Market Deployment (pp. 5-14). River Publishers
- Geser, H. (1992). Kleinstaaten im internationalen System. *Kölner Zeitschrift für Soziologie und Sozialpsychologie* 44(4), 627–654.
- Girvan, N. (2010), Are Caribbean Countries Facing Existential Threats? Available online: <http://www.normangirvan.info/wp-content/uploads/2010/11/existential-threats.pdf>
- Guillaumont, P. (2010). Assessing the economic vulnerability of small island developing states and the least developed countries. *Journal of Development Studies*, 46(5), 828- 854.
- He, W., Yan, G., & Xu, L. (2014) Developing vehicular data cloud services in the IoT environment. *IEEE Transactions on Industrial Informatics*. doi:10.1109/TII.2014.2299233
- Heckscher C. & Applegate L. M. (1994). Introduction (pp 1-13). In Donnellon, A., & Heckscher, C. C. (Eds.), *The post-bureaucratic organization: New perspectives on organizational change*. Newbury Park, CA: Sage Publications.
- Holmes, F. (1976). Development problems of small countries. In L. V. Castle & F. Holmes (Eds.), *Co-operation and development in Asia Pacific region: Relations between large and small countries* (pp. 43-66). Tokyo, Japan: Japan Economic Research Centre.
- Holmes, K. and M. Crossley, M. (2004). "Whose Knowledge, Whose Values? The Contribution of Local Knowledge to Education Policy Processes: A Case Study of Research Development Initiatives in the Small State of Saint Lucia." *Compare*, 34 (2): 197-214.
- Jones, Phillip W. (2004). "Taking the Credit: Financing and Policy Linkages in the Education Portfolio of the World Bank." In *The Global Politics of Educational Borrowing and Lending*, ed. G. Steiner-Khamsi. New York: Teachers College Press.
- Joshi, G. P., & Kim, S.W. (2013). Survey, nomenclature and comparison of reader anti-collision protocols in RFID, IETE Technical Review, [cited 2013 May 20]; available online <http://tr.ietejournals.org/text.asp?2008/25/5/285/44659>
- Jules, D. T., & Sa e Silvia, M. (2008). How different disciplines have approached South-South cooperation and transfer. In H. Williams & K. Downey (Eds.), *South-South Transfer* (pp. 1-13). New York: Society for International Education, Teachers College.
- Jules, T. D. & Ressler, P. (forthcoming). Is 'small' always small and 'big' always big? Re-reading educational policy and practice in small states. Berlin, Germany: Peter Lang.
- Jules, T. D. (2008). *Re/thinking harmonization in the Commonwealth Caribbean: Audiences, actors, interests, and educational policy formation* [Doctoral Dissertation]. New York, NY: Teachers College, Columbia University
- Jules, T. D. (2012). *Re-reading the Anamorphosis of Educational Fragility, Vulnerability, and Strength in Small States*. *Current Issues in Comparative Education*, 15(1), 5–13.
- Jules, T. D. (2015a). "Educational Regionalization" and the Gated Global: The Construction of the Caribbean Educational Policy Space. *Comparative Education Review*, 59(4), 638–665.
- Jules, T. D. (2015b). The Caribbean educational policy space: Educational gradualism, zero-sum policy reforms, and lesson-drawing in small (and micro) states. *Journal of Supranational Policies of Education*, 3, 307–329.
- Jules, T. D. (forthcoming). *The new global educational policy environment: Gated, regulated and governed*. Bingley, United Kingdom: Emerald Publishing.
- Kjellén, B. (2008). *A New Diplomacy for Sustainable Development. The Challenge of Global Change*. London: Routledge.
- Kuwayama, M. (1999). *Open regionalism in Asia Pacific and Latin America: A survey of the literature*. New York, NY: United Nations, ECLAC
- Kuznets, S. (1960). Economic growth of small nations. In E.A.G. Robinson (Ed.), *Economic consequences of the size of nations* (pp. 14-32). London, UK: Macmillan.
- Lam, E. 2010. "Sharing Best Practices in Barbados and Trinidad and Tobago: Patterns of Policy Implementation and Resistance." *Compare: A Journal of Comparative and International Education* 41 (1): 25–41.
- Li, S., Xu, L. D., & Zhao, S. (2015). The internet of things: A survey. *Information Systems Frontiers*, 17(2), 243-259. doi: <http://dx.doi.org/10.1007/s10796-014-9492-7>
- Louisy, P. (2001). Globalisation and Comparative Education: A Caribbean Perspective." *Comparative Education* 37 (4): 425–438. <http://www.jstor.org/stable/3099553>
- Manu, M. A. (2015). *Value Creation and the Internet of Things: How the Behavior Economy will Shape the 4th Industrial Revolution*. Ashgate Publishing, Ltd.
- Maroy, C. (2012). Towards post-bureaucratic modes of governance: A European perspective. In: G Steiner-Khamsi and F. Waldow (eds) *Policy Borrowing and Lending in Education: 2012 World Yearbook of Education* pp. 62–79. Abingdon, UK: Routledge,
- Maroy, C. (2009). Convergences and hybridization of educational policies around 'post bureaucratic' models of

References

- regulation. *Compare*, 39(1), 71-84.
- Marquez, J., Villanueva, J., Solarte, Z., & Garcia, A. (2016). IoT in Education: Integration of Objects with Virtual Academic Communities. In *New Advances in Information Systems and Technologies* (pp. 201-212). Springer International Publishing.
- Mayo, P., Pace, P. J., & Zammit, E. (2008). Adult education in small states: the case of Malta. *Comparative Education*, 44(2), 229-246. <http://doi.org/10.1080/03050060802041746>
- McBrian, H. (2001). Open regionalism: CARICOM integration and trade links. In V. Bulmer-Thomas (ed.), *Regional integration in Latin America and the Caribbean: The political economy of open regionalism*. ILAS.
- Meyer, H. D., & Benavot, A. (Eds.). (2013, May). *PISA, power, and policy: The emergence of global educational governance*. Symposium Books Ltd.
- Oppong, N. (2016) The twists and turns of institutional innovation in small island developing states: the case of Tuvalu, *Commonwealth & Comparative Politics*, 54:1, 23-45, DOI: 10.1080/14662043.2015.1124498
- Ozga, J. (2009). "Governing Education through Data in England: From Regulation to Self-evaluation." *Journal of Education Policy* 24 (2): 149-162. doi: 10.1080/02680930902733121.
- Reynolds, C. W. (1997). Open regionalism: Lessons from Latin America for East Asia. Working Paper, University of Notre Dame, Helen Kellogg Institute of International Studies, Number. 241.
- Robertson, S., Bonal, X., & Dale, R. (2002). GATS and the education service industry: The politics of scale and global reterritorialization. *Comparative Education Review*, 46(4), 472-495. Retrieved from <http://www.jstor.org/stable/10.1086/343122>
- Robinson, G., Morgan, J., & Reed, W. (2016). Disruptive Innovation in Higher Education: The Professional Doctorate. *International Journal of Information and Education Technology*, 6(1), 85.
- Philpot, D., Gray, T. S., & Stead, S. M. (2015). Seychelles, a vulnerable or resilient SIDS? A local perspective. *Island Studies Journal*, 10(1), 31-48.
- Pons, X. and von Zanten, A. (2007). Knowledge circulation, regulation and governance. Literature review (part 6). Louvain, Belgium: EU Research Project, Knowledge and Policy in Education and Health Sectors. Retrieved from <http://www.knowandpol.eu>
- Pretz, K. (2013). The Next Evolution of the Internet. [cited 2013 May 20]; available from <http://theinstitute.ieee.org/technology-focus/technology-topic/the-next-evolution-of-the-internet>
- Reiterer, M. (2009). ASIA-EUROPE MEETING (ASEM): fostering a multipolar world order through inter-regional cooperation. *Asia Europe Journal*, 7(1), 179-196.
- Resnik, J. (2016). The power of numbers and networks: understanding the mechanisms of diffusion of educational models. *Globalisation, Societies and Education*, 14(2), 151-160. <http://doi.org/10.1080/14767724.2016.1173821> (accessed 17 May 2016).
- Rhodes, R. A. W. (1997). *Understanding governance: Policy networks, governance, reflexivity and accountability*. Buckingham: Open University Press.
- Robinson, G., Morgan, J., & Reed, W. (2016). Disruptive Innovation in Higher Education: The Professional Doctorate. *International Journal of Information and Education Technology*, 6(1), 85.
- Schwab, K. (2016, May 14). The Fourth Industrial Revolution. Retrieved May 14, 2016, from <https://www.foreignaffairs.com/articles/2015-12-12/fourth-industrial-revolution>
- Soobratty, J. B. (2015). Exploring the potentials of Intercultural Education in sustaining Social Cohesion in Small Island Developing States. *International Journal of Learning, Teaching and Educational Research*, 13(4).
- Steiner-Khamsi, G. (2016). Standards are good (for) business: standardised comparison and the private sector in education. *Globalisation, Societies and Education*, 14(12), 161-182. <http://doi.org/10.1080/14767724.2015.1014883>
- Sutton, P. (2006). *Modernizing the state: Public sector reform in the Commonwealth Caribbean*. Kingston, Jamaica: Ian Randle Publishers.
- Thompson, C. (2016). Disruptive Innovation in Graduate Nursing Education: Leading Change. *Clinical Nurse Specialist CNS*, 30(3), 177-9.
- Vermesan, O., Friess, P., Guillemin, P. Giaffreda, O., Grindvoll, H. Eisenhauer, M., ... Tragos, E. Z., (2014). Internet of things beyond the hype: Research, innovation and deployment. In Vermesan, & P. Friess, (Eds.). *Internet of Things-From research and innovation to Market Deployment* (pp. 15-85). River Publishers.
- Veeenendaal, W & Wolf, S. (2016) Concluding remarks: Achievements, challenges, and opportunities of small state research, in S. Wolf (ed.) *State Size Matters: Politik und Recht im Kontext von Kleinstaatlichkeit und Monarchie* (pp 277-284). Wiesbaden, Germany: Springer Fachmedien Wiesbaden.
- Wei, S. J., & Frankel, J. A. (1995). Open regionalism in a world of continental trade blocs. *IMF Staff Papers* 45, no. 3: 440-453.