Leading in the Information Age: A Systems Leadership Approach to Foster Technology Adoption in Japanese Higher Education

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The COVID-19 pandemic wrought chaos across the higher education (HE) sector globally, forcing institutions to shift to online program delivery rapidly and without time for preparation. The Japanese HE sector faced a particularly daunting task in providing course content online due to the relatively low adoption and usage rates of educational technologies, such as learning management systems (LMS). This paper provides a theoretical framework, leveraging systems leadership, complexity theory, and Rogers' (2003) diffusion of innovations model, suggesting a principled approach HE leaders in Japan and similar contexts can utilize to expedite the adoption of LMSs and other educational technologies in their institutions. In alignment with the recommendations of Rogers' model and systems leadership theory, the paper suggests leaders cultivate greater capacity in their organizations to adopt change, identify a group of early adopters, prepare and deliver professional development opportunities for faculty to develop educational technology proficiency, and then look to build the leadership capacity necessary to deal with similar adversity in the future. The paper also underscores the need for greater research into systems leadership perspectives in the Japanese HE context.

Key Words ：Diffusion of Innovations Model, Japan, Higher Education, Systems Leadership, Innovation

Introduction

The Information Age has brought with it a myriad of challenges and opportunities for innovation across various sectors that necessitates a disruption of long-adhered-to practices and processes. In this environment, higher education (HE) has struggled to fully integrate information technology (IT) systems and tools into the traditionally change-resistant cultures of universities. Despite the potential technology holds to enhance the learning experience and outcomes of the so-called *digital native* student, higher education institutions (HEIs) have been slow to embrace technology enhanced learning environments in a meaningful way. The emergence of the COVID-19 pandemic in 2020 left HEIs reeling globally (Colpitts *et al.*, 2020; Glantz & Gamrat, 2020), as institutions quickly shifted delivery of their programs online, necessitating a near complete reliance on learning management systems (LMSs) and other emergent educational technologies. This transition was particularly challenging in Japan, where HEIs have been slow to adopt educational technologies (Funamori, 2017; Vasilache, 2017).

Concurrently, the emergence of the knowledge economy and the essential role HEIs play in knowledge production has prompted a rethink of how HEI leadership can better facilitate holistic, institutional change. In this new economy, new theoretical perspectives on how to lead effectively suggest organizations embrace a multi-faceted, systems approach to leadership that enables leadership practices both in traditional leadership roles and throughout an

organization (Collet *et al*., 2019; Uhl-Bien *et al*., 2007). The present paper describes a theory-centred approach leadership at Japanese HEIs can adopt and adapt to catalyze an increase in the use of educational technologies, most notably LMSs, at institutions in Japan. Rooted in systems leadership theory, this paper utilizes key constructs associated with this theory, in particular complex adaptive systems (CASs) and Roger's (2003) diffusion of innovations model (DIM), to suggest a principled approach for leaders to enable their institutions to acclimate to emerging disruptions in HE.

Background

In recent decades, the global economy has shifted from one premised on the trade of tangible goods, to being centered on the commodification of knowledge (Hadad, 2017; Uhl-Bien *et al*., 2007). This transition, expedited by the intertwining processes of globalization, internationalization, and the commodification of higher education have convoluted the role and focus of HEIs globally (de Wit, 2020; Hemsley-Brown *et al*., 2016; Lundvall, 2016; Uyarra, 2010). The emergence of the global East, particularly East Asia, as a potential challenger to the hegemony of Western, English-speaking HE markets has attracted attention from global scholars to the region's role in the future growth of HE (Layne, 2012; Marginson, 2011).

Despite its position as the earliest adopter of mass tertiary education in East Asia (Marginson, 2011; Sanders, 2018), Japan's HE sector has fallen behind other HE markets in terms of their willingness to accept LMSs and educational technologies, and use them to enhance learning practices and outcomes. Consider for example that while leading HE sectors saw near universal penetration of LMS usage at HEIs, with the United States at 99% and the United Kingdom reaching 95% in 2015 (Dahlstrom *et al*., 2014; Vasilache, 2017), the penetration rate in Japanese national public HEIs at the same time was 80%, 60% at local public universities, and 20% at private institutions (Funamori, 2017). The notably low usage among private, for-profit institutions is especially concerning given that they are responsible for educating three-quarters of Japan's university population (Marginson, 2011). In light of these numbers, Japanese institutions were faced with a significantly greater challenge in shifting to emergency online teaching than institutions in regions with greater

digital preparedness (Colpitts *et al*., 2020; Kanno, 2020).

Cultivating HEIs adept at dealing with the confluence of change drivers in the modern HE environment requires capable HE leadership. Although traditional leadership theory and the ensuing typologies of leadership it has informed and bred has largely focused on top-down approaches, these styles have been criticized for being ineffective for organizations in the knowledge economy (Collet *et al*., 2019). This may be compounded by the organizational structure of HEIs, which have spurned pyramidic structures in favor of a more distributed leadership model in which decision-making authority is delineated between institutional and departmental leadership, administrators, and faculty members (Buller, 2015; Clegg, 2008). Acknowledging the role of different agents as participants in organizational systems, complexity theory has emerged to provide theoretical rationale to the view of organizations as complex adaptive systems (CASs) where one finds "multiple agents dynamically interacting in fluctuating and combinatory ways" (p. 3). In CASs, leaders act to *influence* rather than *engender* the cultivation of organizational capacity to embrace changes, such as the opportunities to deliver stronger learning outcomes provided by IT (Lichtenstein & Plowman, 2009).

More innovative leadership models and practices may help institutions in Japan meet the challenges of the *new academy* (Barone, 2018). The *new academy* describes those HEIs prepared to educate the needs of the net generation. These institutions will be defined by four key pillars: 1. acknowledging changes emerging from the Net Generation; 2. utilizing technology to enhance learning; 3. reflecting the interconnectivity between culture and technology; and 4. changing the way in which members (or for the purpose of this paper, *agents*) interact (Barone, 2018). The importance of the new academy can be underscored by the increasing interest in LMS usage and online program delivery more generally (Dahlstrom *et al*., 2014), coupled with aims to rectify contradictions between technology usage and sound pedagogy (Koehler & Harris, 2009; Puentedura, 2013, May 29). As technology and pedagogy converge in the HE sphere, they often collide "with the process, structure, governance, power relationships, and cultural values of the traditional campus" (Barone, 2018, 14.2) at a time where student expecta-

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tions of HEIs are changing rapidly (Kamvounias & Varnham, 2006). This assertion further highlights the need for leadership that can enable rather than stymie innovation in HEIs.

Theoretical Lens

The present paper proposes a theoretical approach for HE leaders to address hesitancy to use LMSs among faculty at Japanese universities by leveraging concepts proposed in the literature surrounding systems leadership theory and Roger's (2003) model. These complimentary models, both with theoretical roots in complexity theory, similarly view organizations as CASs. Whereas systems leadership theory addresses issues surrounding the application of leadership, DIM proposes a specific method for implementing disruptive change. Specifically, DIM describes how "*innovations*, defined as ideas or practices that are perceived as new, are spread" (Rogers *et al.*, 2005, p. 3). Rogers *et al.* (2005) prescribes how to best implement innovations rapidly and efficiently.

Existing models of leadership largely evolved prior to the knowledge economy, in post-industrial societies centred on the production of tangible goods (Collet *et al.*, 2019). These top-down approaches to leadership have been said to not be suitable for organizations which aim to thrive in the knowledge economy. Furthermore, they prove problematic by "focusing on the 'periphery' and 'content' of leadership with disregard for the essential nature of what leadership is—a process" (Uhl-Bien *et al.*, 2007, p. 300). Systems leadership theory aims to reconcile the incongruency between leadership models intended for the post-industrial economy and their application in organizations aiming to succeed in the knowledge economy by characterizing and treating them as CASs. A systems leadership perspective suggests that the exchange between a leader and followers is not linear; rather, it purports that "since the vast number of total interactions in an organization occur between peers rather than between formal leaders and their 'followers,' much of the raw influence in the system likely accrues beyond the traditional manager–follower dyadic roles" (Lichtenstein & Plowman, 2009, p. 618).

The DIM is a theoretical model of change implementation that emerged from systems thinking that prescribes a process by which leaders can better enable the adoption of changes in their organiza-

tion. The DIM suggests that leaders identify a group of early adopters more willing to adopt innovations and embrace change (Rogers *et al.*, 2005). Rogers *et al.* (2005) argue that implementing a strategy following the DIM is more likely to succeed with a heterogenous group of agents, who share a degree of homophily in terms of their culture (which could include area of expertise or a shared lexicon in HE). Additionally, the innovations most likely to succeed are those which are advantageous to the adopters, align with their existing values or culture, are comparatively easy to integrate and adapt, are observable or palpable, and those which can be piloted prior to implementation (Rogers, 2003). Emerging research from a variety of contexts suggests the appropriacy of the DIM as a conceptual or theoretical framework for gauging the adoption of innovation in HE (Bozalek *et al.*, 2013; Chan *et al.*, 2016; Doyle *et al.*, 2014). Leaders can be better placed to enable organizations adept at integrating such innovations by adopting a systems leadership approach.

To maximize the potential adoption of change, systems leadership theory proposes organisations must enable *emergence* (Lichtenstein & Plowman, 2009; Uhl-Bien *et al.*, 2007). Emergence explains action-at-a-distance or "how a force emanating from one source, e.g., leadership practice, impacts on another, e.g., improvement of student learning and achievement" (Duignan, 2014, p. 168) can *influence* other parts of an organisation. Lichtenstein and Plowman (2009) suggest four sequential preconditions necessary to engineer emergence within an organisation: 1. a disequilibrium state; 2. amplifying actions; 3. recombination/self-organisation; and 4. stabilizing feedback. A disequilibrium state can be evoked by "a notable movement away from stability and toward dis-equilibrium, which sparks emergent change processes" (Lichtenstein & Plowman, 2009), including both systemic threats and opportunities, and a divergence from status quo maintenance. Challenging the status quo is particularly emergent in the context of HE given the endemic nature of change resistance in higher education more broadly (Aasen & Stensaker, 2007; Wernick, 2006), and the rigid hierarchies existing in Japan and other East Asian societies in particular (Park *et al.*, 2019; Phong-Mai, Terlouw, & Pilot, 2005).

Definition of Problem of Practice

The Japanese HE sector has been comparatively slow to adopt educational technologies, and particularly the LMS, to enhance learning environments for students when it is contrasted with the HE sectors of other major global economies (Funamori, 2017; Vasilache, 2017). A cultural adherence to seniority-based power hierarchies and the general change-resistant nature of HEIs globally further convolutes this transition. The adoption of a systems leadership perspective, utilizing the DIM, offers one promising means of ensuring these institutions can adapt to the new academy and meet the needs of the net generation. In particular, it provides a strategy HEI leaders can leverage to encourage the adoption of educational learning technologies in their institutions.

Carving a Path Forward

Enacting systemic adaptability. Systems leadership theorists postulate that before a system can adopt a set of radical changes, it must be set into a state of disequilibrium (Lichtenstein & Plowman, 2009). This would also provide the preconditions necessary for the rapid adoption of new innovations. However, oft lost in the theory are concrete protocols suggesting how leaders can achieve disequilibrium in their organizations. Buller (2015) similarly notes, "until the pain of doing nothing becomes greater than the pain of doing something, most people will continue to do nothing" (p. 7). Buller (2015) refers to this as the IKEA effect: human's tendency to over-value what they have themselves built or taken part in designing. Buller thus explains that a leader must first cultivate a sense of urgency to encourage faculty members to accept the proposed changes. A systems leader perspective views each agent in a CAS as one who can affect change, beyond the traditional leadership roles in top-down organisations, which demonstrates the importance of empowering leadership at various levels within an organization to engage greater adapatability.

Clegg (2008) suggests that middle management is most effective in an organization in which "there is capability for variety in work and innovation is rewarded, where middle managers can be at the heart of affairs (physically and emotionally), and where they can participate in high-level decisions and problem-solving situations" (p. 22). Middle management can be emboldened by affording them

the flexibility to take action and implement policy without restriction (Clegg, 2008). It is one of the goals of systems leadership to arouse bureaucratic (e.g., administrative), enabling (the system), and adaptive (to change) leadership within organisations to create interdependency and tension within a system (Uhl-Bien *et al.*, 2007). Interdependency and tension within a CAS feed into the development of emergence within an organization, which in turn improves the chances of success when promoting innovation (Lichtenstein & Plowman, 2009; Uhl-Bien *et al.*, 2007). Simply put: HE leaders in Japan may be best served by enabling greater decision-making authority throughout their organizational hierarchies, allowing various agents to engage in the leadership process and ensure the success of a given innovation.

Identifying a group of early adopters. The DIM prescribes that an innovation is more likely to gain traction when it is trialed within a heterogenous group or faculty in the case of HE. This is more challenging than it sounds in the Japanese context, where 80% of faculty positions are held by men and only 2.4% of full-time positions—which tend to be home to those with significant authority—are held by non-Japanese nationals (Yamamoto, 2018). The largest number of non-Japanese faculty are based in the languages (Huang, 2018) and they may serve as a promising group of individuals to target for an intervention using the DIM. The nature of teaching language often requires a blend of native-, Japanese, and non-native speakers of English. Alternatively, a school of international studies or business may, again by the nature of its study focus, require more diverse groups of faculty to deliver course programming. Somewhat contrastingly, the group must be heterogenous enough to allow for reactivity, while still sharing enough homophily (or affinity) to ensure the diffusion of the innovation (Rogers, 2003). Rogers identifies language as one tangible barrier to the DIM model, thus possibly precluding departments in which faculty do not share a common language of communication.

Addressing impediments to technology adoption with sound leaership. After a suitable group has been identified to serve as early adopters, leaders must take a principled approach to overseeing the implementation of the innovation. Noting that in the new academy "the 'hands-off' leadership style

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resulting from traditional shared governance models does not lend itself to situations requiring dynamic change; it is better suited to preservation than to transformation" (Barone, 2018), a systems leader will seek to create emergence within their institution. According to Dahlstrom *et al.* (2014) few teachers have an adequate amount of knowledge regarding the proper utilization of LMSs to create truly engaging learning environments. Iwasaki *et al.* (2011) further argue Japanese instructors lack the support and training necessary to maximize their usage of the LMS. This is problematic, as Dahlstrom *et al.* (2014) also noted higher satisfaction rates among students in courses where the faculty used more sophisticated LMS functions, which in turn provide an opportunity for better student learning outcomes. A leader could create a state of disequilibrium by insisting said faculty provide its programs in a blended learning format on the LMS chosen by the institution.

One promising idea to boost faculty comfort and knowledge with LMS teaching pedagogy is for leaders to have faculty learn LMS systems by engaging in professional development (PD) programs delivered through the LMS themselves (Barone, 2018; Parker, 2011). In doing so, faculty can learn sound theory related to effective LMS usage while becoming familiar with the functions of the LMS environment. Leaders could employ an educational technologist or a faculty member similarly well-versed in designing technology-enhanced learning environments to create this program. Educational technologists have been identified as vital tools in emboldening technology use in HE systems (Kowch, 2013b, 2018). The chosen faculty would then learn the theory of technology-enhanced pedagogy and at the same time engage in a process of experiential learning of their LMS. In order to ensure the program is best-suited to achieve its aims, all stakeholders (particularly the faculty and students themselves) should be consulted in advance in regards to the design of the program.

Sustaining innovation and creating leadership capacity. A short-term intervention to address the low usage rates of LMSs at Japanese HEIs can be implemented using the DIM. However, looking towards the future and developing a legacy of strong leadership capable of sustaining such innovations and addressing future challeages Japanese HEIs and the HE sector need to invest in developing the capacity of their leaders. Leadership theory has evolved from viewing the leadership attributes as innate to the individuals who embody them (Antonakis, Bastardoz, Liu, & Schriesheim, 2014) to contemporary theories focused on attainable characteristics and skills (Amanchukwu *et al.*, 2015; Gardner *et al.*, 2010). More recently, theorists have postulated that in the knowledge economy leadership comprises both the actions of an individual, as well as their ability to enable leadership throughout organizational structures (Collet *et al.*, 2019; Uhl-Bien *et al.*, 2007), and that sound leadership is necessary to better manage organizations using the CAS perspective (Kowch, 2013a). It is thus pertinent that we ensure that the Japanese HE leadership strata is afforded opportunities to cultivate the skills necessary to address present and future challenges.

Unlike in other organizations, leadership in HEIs is often determined on a rotational basis which "is largely based around principles of collegiality, yet this does not fit well with the demand for efficient and effective use of resources" (Black, 2015, p. 56). In principle, this results in a system of "first among equals" (Davies *et al.*, 2001) under which senior academics share the role of being leader. Such a system is not designed to ensure they have the qualities, skills, or experience to effectively manage these roles. While literature on the efficacy of leadership training (and leadership theory more generally) in the East Asian sphere is relatively scant, one institution has a demonstrated effective HE leadership training can bear fruit. As part of a wider institutional reform program, Nanyang Technological University in Singapore first conducted a survey of its faculty, administrators, and leaders, and found for leaders that "excelling in their roles as researchers, instructors and mentors did not prepare them to lead an academic unit" (Tonini *et al.*, 2016, p. 40). Based on these results, the institution created a leadership training program and the results were extremely promising. As well as ascending the World University rankings from 39th to 13th in 2016, the institution placed among the top young universities for seven years running, and has become one of the most diverse universities globally (Davie, 2020; Tonini *et al.*, 2016). A program aimed at fostering stronger technological capacity among leadership might employ a strategy similar to this one described.

Conclusion

Higher education institutions must rise to meet the emerging demands placed upon the new academy by students born into the net generation. Cultivating competent leadership in Japanese HEIs is an essential precursor to plan for emerging challenges presented by technology, internationalization, and other sudden major disruptors (such as the COVID-19 pandemic). Ensuring faculties embrace educational technology as a means of improving learning environments for students is one component in adapting institutions to meet this and other challenges. Systems leadership and the diffusion of innovations model provide a strong, principled approach leaders can adopt to ensure wider and more effective usage of LMSs and other educational technologies on campuses. It can also be leveraged to integrate other emerging innovations. This paper highlighted the need for further research into leadership and its influence on pedagogy at institutions in Japan, and how systems leadership theory can inform more widespread technology adoption at these institutions.

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