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Informal distributed leadership in technology adoption

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This study investigated the role of informal distributed leadership in dealing with the complexities of adopting technology innovation in Higher Education contexts. In the study, in-depth semi-structured interviews and focus group discussions were held with a group of informal leaders in a South African university. The findings suggest that informal distributed leadership works best in promoting technology adoption when there is a clear understanding of: (1) the locus of control of technology adopters; (2) power contestations between academics and students; (3) alignment of technology with pedagogical goals; and (4) shared intentionality between the core group of informal leaders. In practical terms, the study offers a middle-of-the-road approach to diffusion of technology innovation as an alternative to the ineffective top-down and individual innovative leader (bottom-up) approaches. For originality/novelty, the study introduces the distributed leadership theory into the technology adoption discourse.

Keywords: Informal; distributed; leadership; technology; innovation; adoption

JEL classification: O33; O32

Introduction

Although the discourses of *technology adoption* in the Higher Education (HE) context (Ajjan and Hartshorne 2008; Rambe and Nel 2014) and *leadership* (Crosby and Bryson 2010; Mathooko 2013) have been widely articulated in *technology adoption leadership literature*, these discourses have evolved independently to the extent of constituting irreconcilable binaries owing to their *location* and *foci* differences.

From a *location* perspective, *technology adoption* is often constructed as the domain of educators, educational technologists and learning designers who are operatives/practitioners with technical knowledge and experience in conceptualising, designing and implementing innovative technology solutions (Bartol and Zhang 2007; Backhouse 2013).

On the contrary, *leadership* discourses have been traditionally constructed from the perspective of traits of leaders who are often senior academics and whose strategic positions and decisions shape the direction of subordinates (Crevani, Lindgren and Packendorff 2010; Youngs 2013).

From a *focus* perspective, *technology adoption* concentrates on, but is not limited to, *processes* of technology uptake and diffusion within organisations (Olofsson et al. 2011; Ng'ambi and Bozalek 2013) while *leadership* debates have traditionally concentrated on inter alia individuals': personality, styles of leadership and traits of the leader in given contexts (Mumford et al. 2002; Pearce 2007; Mathooko 2013; Youngs 2013). Of course, these individualist perspectives of leadership discuss leaders in their individual capacities as well as their involvement in group dynamics.

Further compounding the complexity of the technology adoption-leadership divide is that few attempts have been made to reconcile this duality through, for instance, understanding the role of leadership in technology adoption and diffusion in organisations (Ng'ambi and Bozalek 2013; Backhouse 2013). Even where attempts have been made, they have generally not attempted to understand the mutually constitutive nature of leadership and technology adoption to the extent that these studies have ironically reinforced binaries. For instance, studies that examine the role of leadership in technology adoption have either emphasised hierarchical (i.e. top-down) approaches to technology adoption (Chang, Chin and Hsu 2008; Wolfenden 2008; Thakrar, Zinn and Wolfenden 2009) or bottom-up (e.g. innovative technology leader/e-learning champion) approaches (see Backhouse 2013; Ng'ambi and Bozalek 2013). To overcome this dualism, the researchers take a middle-of-the-road approach that acknowledges both the strategic influence of senior management in technology innovation and the self-regulating psyche/decision-making processes of an autonomous, cohesive group of informal leaders involved in technology adoption and leadership (what we term *informal distributed leadership*).

Problem statement

The problem is the limited understanding of the role of informal distributed leadership in technology adoption and diffusion in organisations. This challenge emerges from the tradition of a problematic, hierarchical conception of traditional leadership as the domain of senior executives (i.e. senior managers, senior administrators) and technology adoption as the preserve of operational staff (technology designers, educational technologists, curriculum designers). This hierarchical polarity, itself driven by fictitious specialisation, has constrained a broader recognition of technology adoption by a diverse group of differentially positioned (in terms of hierarchy and fields of specialisation) informal leaders comprising senior academics, educational technologists and educators.

Objectives

The main objective of the study was to unravel the role and contribution of informal distributed leadership in adopting

emerging technologies for teaching critical citizenship in the context of HEIs. The subsidiary objectives were to comprehend the role of a group of informal distributed leaders (comprising an educational technologist from the Centre for Educational Technology and a teaching team from the Department of Extramural Studies) in:

1. Emerging technology adoption in a Global Citizenship programme.
2. Navigating the complexity of implementing the programme for a culturally diverse, heterogeneous class.
3. Understanding informal distributed leadership processes in the university's Global Citizenship programme.

Literature review
Technology adoption and traditional leadership as divergent discourses
The technology adoption discourse and traditional leadership discourse have evolved as parallel divergent discourses owing to their location and foci differences. In terms of *location*, technology adoption in Higher Education Institutions (HEIs) is often generally considered to be the domain of educators, educational technologists, learning designers and e-librarians at the operational levels, notwithstanding the pervasiveness of technology across departments and the organisational hierarchy. In HEIs the technology adoption discourse tends to consider lone individuals (educators) adopting established technologies and/or experimenting with new technologies at operational levels. As such, educators' attitudes towards teaching and learning technologies (hereafter referred as educational technologies), skills in using technology and willingness to risk new forms of teaching are often emphasised as key factors in educators' engagement with educational technologies (Backhouse 2013). Similarly, the capabilities and strategies of aspiring technology leaders (again at operational levels) in utilising educational technologies to facilitate learning and development are touted as critical levers for the success of educators in keeping abreast with technologies (Bartol and Zhang 2007).

While the aforementioned discourses on the adoption of technology in HEIs are situated at the operational levels of pedagogy and technology application, albeit the seniority of certain educational technologists and learning designers in exceptional cases (see Clarkson and Oliver, 2002; Trinidad, Newhouse and Clarkson, 2005; Ng'ambi and Bozalek, 2013), a picture of fragmentation is conjured when these discourses are deliberated in relation to leadership. The dialogue on technology adoption in HEIs circles is often framed around technology uptake at operational levels (Olofsson et al. 2011, 2015), whereas that on leadership is often constructed theoretically from the perspective of top leadership or senior academics who exercise of positional authority and symbolic power over their subjects and whose personal influence and energy shape the courses of actions of subordinates (Mumford et al. 2002; Woods 2004; Youngs 2013). The focus on senior leadership almost eclipses the contribution of subordinates in decision-making processes. Woods' (2004) account of the reasons for the emergence of distributed leadership highlights the limitations of relying on the single, "heroic" leader (in a high, privileged position) and recognises that tapping into the ideas, creativity, skills and initiative of the majority in a group or organisation unleashes a greater capacity for organisational change, responsiveness and improvement.

With regard to focus, while technology adoption has often emphasised *process of adoption and diffusion*, the discourse of leadership has revolved conspicuously around the personalities, traits and capacities of individuals. The technology adoption discourse in HEIs mainly targets the use and uptake of technologies. Use depicts "ongoing use" and uptake signifies "the processes of implementation and integration of new aspects of digital technologies and how they are made use of" respectively (Olofsson et al. 2011, 2015). On the contrary, Youngs (2013) maintains that leadership theory has predominantly been aligned to an individual leader-centric perspective with an increased additional emphasis in recent decades on multiple followers and context. At the core of leadership is the capacity of the leader to stimulate followers intellectually, provide enthusiastic support for creative ideas, get involved and encourage others to get involved in the innovation process, and give followers sufficient autonomy to create new products or services (Mumford et al. 2002).

Hierarchical technology adoption in higher education
While technology adoption and traditional leadership discourses often intersect at the level of technology leadership, the deliberation of technology leadership is often couched in ways that reinforce polarisation. Such binaries manifest in either the weight given to senior leadership, which potentially reduces educators to mere implementers and appendages of hierarchically designed technology programmes or entrench bottom-up approaches that exaggerate the agency and volition of educationists and educational technologists in technology adoption.

From the South African higher education perspective, top-down approaches often implicitly give preponderance to senior leadership whose crafting of university strategic plans, academic plans and teaching plans, shape and inform the conception, direction and adoption of technology in teaching and learning programmes (University of Cape Town 2009; University of Cape Town [UCT] Teaching and Learning Strategy 2013; Central University of Technology [CUT] Academic Plan 2011). At South African universities, a top-down approach is often the norm in institutions' strategic plans. For instance, UCT's teaching and learning strategy is a high profile, overarching document aimed at meeting the strategic goal of providing support, structure and promote educational technology usage to improve of quality teaching and learning. It emphasises the utilisation of technology to enable greater engagement for large classes, promote pedagogical flexibility in addressing diversity, allow for breadth in curricula and provide online preparation for potential postgraduate candidates (UCT Teaching and Learning Strategy 2013). We infer that this strategy emerges from the senior managers of the university's provision of strategic direction on the conception, design

and implementation of teaching and learning, drawing on the utilisation of available technologies.

The Mission Statement of the University of the Western Cape (UWC) reiterates the university's commitment to excellence in teaching, learning and research and to responding in critical and creative ways to the needs of a society in transition (UWC Research Policy 2009). Mindful of the capacity of new technologies to enable and enhance university teaching and learning, we can infer that embedded in the imperative of advancing excellence in teaching, learning and research is a commitment to exploit and appropriate traditional and emerging technologies to promote teaching and learning programmes that put the university "at the cutting edge of knowledge production and transfer" (UWC Research Policy 2009:3). The central role of top leadership in the conception and design of technology-enhanced teaching programmes is inherent in the requirements for teaching delivery methods to be consistent with the centrally instituted academic plans.

The top-down approach therefore employs centrally defined goals and strategies (e.g. five-year strategic plans, academic plans, teaching and learning plans) as main benchmarks for envisioning, conceptualising and implementing technology supported teaching and learning. These documents are often cascaded from the organisational apex for implementation by implementation agencies (e.g. teaching and learning divisions, educators, educational technologists) with limited input from the implementing agencies.

The innovative technology leader

Contrary to top-down approaches, bottom-up approaches tend to emphasise the transition/evolution of technology users from being readers of peers' content towards their leadership in online learning communities. This includes the complex role of technology champions in the conception, design and implementation of innovative technology initiatives (Bartol and Zhang 2007; Preece and Shneiderman 2009). An exceptional case of a bottom-up approach to technology adoption at South African universities is the innovative technology leader approach (Ng'ambi and Bozalek 2014; Portugal 2006). In this approach technology leaders or champions must constantly be aware of how to adjust, evaluate, and assess the validity of emerging technologies, content and programmes to remain competitive and viable in this their domain of work (Portugal 2006). The operational component of adoption is alluded to in Portugal's (2006) elaboration that emerging technology leaders should combine innovation, contribution, flexibility and adaptability to change in technology-based learning environments to facilitate online learning of learners, persuade colleagues to become champions of the technology programmes as well as overcome the complexities imposed by hierarchical organisations.

At the core of strong technology leadership or championing is the capacity to encourage others to generate new ideas by connecting them to information sources, tapping into available expertise and adopting a participative approach in identifying and developing new ideas (Howell and Higgins 1990a). Drawing on literature,

Howell and Boies (2004) observe that technology champions comprise individuals who: (1) actively and enthusiastically promote innovations through crucial organisational stages; and (2) are pivotal to the successful implementation of an innovation. The personal energy and strong personality orientation of champions are undergirded by the claim that champions (e.g. technology champions) display personal commitments to innovative ideas, promote innovative ideas with conviction and persistence, use informal networks to willingly risk their position and reputation to ensure its success (Schon 1963; Maidique 1980; Howell and Boies 2004). The *technology agent* perspective (hereafter referred as the *individual innovative leader* approach) seems to emphasise the innovation orientation of the individual educator (usually an early adopter of technology) who strategically solicits and acquires the buy in of colleagues in the pursuit of technology innovation at operations levels (a bottom-up approach).

Reconciling the binaries

While the top-down and individual innovative leader approaches are considered as irreconcilable binaries in the aforementioned literature, there is insufficient literature that adopts a middle-ground approach by acknowledging the mutually constitutive nature of these approaches (Backhouse 2013; Ng'ambi and Bozalek 2013). In consonance with a middle-of-the-road approach, Backhouse (2013) submits that the appropriation of educational technologies by educators is in response to top-down initiatives. Similarly, Ng'ambi and Bozalek (2013) are concerned about the paucity of research on informal leaders' role in enabling wide-scale adoption of innovations in HEIs. We infer that technology innovation and leadership can be consequences of the mutual influence of the strategic interventions of senior leadership as such, as they can emerge from experimentation by individual technology champions or groups of informal educators. We argue that technological leadership and innovation can emerge from the conscious, innovative actions of a cohesive group of informal technology leaders who are intractably connected to one another yet quasi-autonomous in their operations (i.e. informal distributed leadership).

Theoretical and conceptual frameworks

Given the failures of traditional leadership approaches in championing technology adoption in the educational arena, the main technology diffusion challenge in HEIs in SA today seems to be finding an appropriate institutional arrangement for allocating leadership responsibility of technology diffusion. Based on the 6E conceptual model of distributed leadership (Jones et al. 2013) as well as insights from the theory of *shared/ collective responsibility* (Young, 2010; Dahan, Lerner, and Milman-Sivan 2011), we explicate the role of *distributed leadership* in enhancing adoption and diffusion of educational technologies for teaching in HEIs in Table 1 (what we coin as *distributed technology diffusion leadership*). In other words, the theory of 'shared or collective responsibility' (Young 2010; Dahan, Lerner, and Milman-Sivan 2011) and the 6E

conceptual model of distributed leadership (Jones, et al., 2013) form the theoretical foundation of our conception of the kind of leadership required for effective technology diffusion in HEIs.

The thesis statement for this study is that for effective technology adoption and implementation to take place in HEIs, there is need for shared or collective leadership responsibility between leaders of the core institutional stakeholder groups (i.e. top leadership, academics and technologists). As can be inferred from Young (2010) and Dahan, Lerner, and Milman-Sivan (2011), shared or collective responsibility means that responsibility for any undertaking in an organisation should be borne by several actors or agents instead of just an individual or selected few based exclusively on their formal leadership position in the organisation. So, in technology diffusion in HEIs, shared or collective responsibility is where the leadership responsibility to promote technology diffusion is not limited to only one or a few formal leaders but is shared by (distributed between): formal and informal leaders; technology and educational experts; and functional, departmental, and discipline levels (Jones et al. 2013) across the HEIs. This stance is borne out of the conviction that like any change endeavour, technology diffusion project will elicit resistant attitudes from educators and students towards formal leaders during implementation. Under such circumstances, distributed leadership becomes essential in using informal leaders; departmental/discipline heads; functional heads; technology experts; and student leaders both formal and informal, etc. in soliciting buy-in from all stakeholder groups thereby reducing resistance to implementation. In the current research involving the formulation of a technology supported programme by senior university management and the cascading of the programme to the departmental level for implementation, liaising with departmental heads who were experienced in giving curricula direction and collaboration with technology experts with vast experience in technology supported programme implementation was envisaged as key to successful programme implementation. Shared responsibility would mean that the university leadership

provide the broad guidelines for programme conformity with institutional imperatives on critical citizenship and community engagement, while implementers (department heads, programme leaders, technology experts, tutors) would constructively align and adapt programme goals, activities and events to suit the aforementioned institutional requirements. While senior formal leadership would be mandated to *enable* the climate for change through the conception of the global programme, the implementers would *enact* the departmental rules of engagement among staff and *encourage* technology enhanced teaching and learning processes that reduce the possible misunderstanding among staff members and unrealistic expectations from both teaching staff and students. The wide choice of technologies available for the programme meant that the core group of informal leaders had to *encourage* a delicate balance between the exercise of authority and the relaxation of control as they engaged with established institutionally provided technologies and those students brought with in their informal learning encounters (see Table 1).

Methodology

A case study approach was adopted for unravelling the role and contribution of informal distributed leadership in mediating the complexity of adopting emerging technologies for teaching critical citizenship. Fouchè and Schurink (2011) suggest that since qualitative researchers are concerned with the meaning participants assign to their life experiences, they use case studies to immerse themselves in the activities of a small number of people in order to obtain some intimate familiarity with their social worlds. A core group of informal distributed leaders (comprising an educational technologist from the Centre for Educational Technology and a teaching team from the Department of Extramural Studies at an elite university) were interviewed in depth to unravel their role in: (1) emerging technology adoption in a Global Citizenship programme; and (2) navigating the complexity of implementing the programme for a culturally diverse, heterogeneous class. Since a case study strives to describe,

Table 1: A framework for distributed leadership approach to technology adoption in HEIs

Element	Activity
Engage	A broad range of leaders are involved in the technology adoption including leaders in positions of institutional authority (formal leaders); academics respected for their leadership but not in positions of institutional authority (informal leaders); experts in learning and teaching; technology experts; experts from other disciplines; opinion leaders from academic staff and student groups
Enable	The contextual and cultural dimension of respect for and trust in individual contributions must permeate the whole process of technology change through emphasis on the nurturing of collaborative relationships between technology experts on the one hand and academics and students on the other hand. It must be recognised that old habits die hard therefore, tolerance need to be shown to incremental change in certain instances.
Enact	A holistic approach should be used so that institutional processes, support and systems are designed to encourage the involvement of all stakeholders not only in implementation of new educational technologies but also in leading the implementation process.
Encourage	It must be realised that numerous and varied activities are required to raise awareness to and to build a culture of distributed leadership. This includes professional development, mentoring, facilitation of networks, communities of practice, time, space and finance for collaboration, and recognition of, and reward for, contribution.
Evaluate	A suitable process needs to be designed to provide evidence of increased engagement in technology usage in learning and teaching, collaboration, and growth in technology adoption leadership capacity.
Emergent	Lessons learnt through ongoing process of cycles of action research built on a participative action research methodology enables improvement in implementation of technology adoption.

Based on the 6E conceptual model of distributed leadership of Jones et al. (2013)

analyse and interpret a particular phenomenon (Yin, 2003), this study served to understand and interpret informal distributed leadership processes drawing on the aforementioned group of informal distributed leaders' (Educational technologist, Programme convener, Project leader, tutors) experiences of the programme. Although the university leadership were excluded from the research as they lacked direct experience of the project at implementation levels due to their exclusive involvement at programme conception, inferences about their involvement at these formative stages (project conception) were made via the informal distributed leaders.

The case study

The South African university under review has a long tradition of unwavering commitment to advancing leadership, social justice and social responsibility of its students to its immediate and extended communities. To promote academic leadership in the community, the Global Citizenship Leading for Social Justice Project (GCLSJ) was established at this university in 2009. The Global Citizenship LSJ Programme was conceptualised in the Office of the Deputy Vice-Chancellor, responsible for Teaching, Learning and Internationalisation and subsequently delegated to the Department of Extramural Studies (DES) for implementation. The Global Citizenship co-ordination team, responsible for the programme implementation comprised the programme convener, the project leader, and two teaching assistants (all from DES), and an educational technologist from the Centre for Educational Technology (CET). The convener and project leader were highly experienced leaders in curriculum design, the educational technologist was a renowned leader in online learning design and facilitation and gave general oversight on the pedagogical design of the programme. The teaching assistants served as online administrators who facilitated student online discussions during the inceptive phases of the programme. The lead author of this paper was tasked to conduct research on the appropriate pedagogical designs and the associated educational technologies to support this leadership programme. This core group can be regarded as an *informal distributed leadership* passionate about using emerging technologies to support student leadership and critical citizenship in their communities.

Goals and objectives of the programme

The Global-CLSJ programme is an extra-curricular programme that strives to foreground students into the enterprise of active citizenship and generate a deep passion to serve their communities. It emphasises practice-based informal leadership, community service, student social responsibility to their communities through volunteering. It stresses critical scholarship on global issues that transcends credit-bearing courses, which emphasise grasping theoretical content. Its pilot phase was completed in 2010 with 100 students from different academic streams. The programme strives to blend face-to-face contact (lectures, reflective activities, events, seminars) with collaborative, reflective online learning activities.

The programme had two modules: *Global debates, local voices* and *Thinking about volunteering: service, boundaries and power*, which were both anchored in critical scholarship on global issues, social justice and giving students practical experiences of contributing and impacting communities. Both modules fostered hand-on experience among students engaging in global citizenship themes, namely: *debating development; war and peace; climate change; Africa in the globalised world* and *volunteering and service*. Module 1 emphasised student engagement with global debates, reflection on prior experiences of developmental issues/volunteering/ service, participation in collaborative learning activities, participation in critical questioning practices and constructions of new knowledge drawing on learned content. Module 2 enabled students to participate in service with the themes: *self and service*, *contexts of inequality*, *the ethics and paradigms of service*, *development* and *sustaining new insights*. Students drew on their experiences of volunteering to effectively serve their communities, critically reflected on constructs and wrote reflective papers.

Data collection tools

Since this paper is pre-occupied with the role of *distributed leadership* in mediating complex technology adoption, it concentrates on informal leaders (i.e. educators) who gave pedagogical direction to the programme. Using unstructured interviews, the educational technologist was interviewed in depth first, at the beginning of the pilot phase of the programme and second, towards the completion of the pilot phase. The interviews examined the objectives of the programme, the choices and justifications of different technologies, informal leadership strategies necessary for steering the programme. Two focus group discussions were held with the GCLSJ project team to explore the pedagogical intentions of the programme, leadership role of the teams, complexities of implementing the programme and how they were resolved.

Data analysis

Thematic content analysis drew on the 6E conceptual model of distributed leadership which provided main themes. These were used as lens to interpret the messages communicated in narratives of technology adoption rendered by the informal GCLSJ group (see Table 2).

Discussion of findings

To unravel the role of *informal distributed leadership* in dealing with the complexities of adopting technology innovation at the university, the study drew on the 6E model as a theoretical and analytical lens for interpreting the messages communicated in the team's pedagogical and technological narratives. As such, the findings are discussed under these themes: *engagement, enablement, enactment, evaluation, encouragement* and *emergent issues*.

Engagement

Engagement emphasised the importance of involving multiple stakeholders – both formal leaders at the

Table 2: Analysis of results based on the 6E conceptual model of distributed leadership

Element	Evidence from the interviews	Researcher comments
Engage	We need to develop an ecosystem of f2f and online interaction and mutual interaction and feedback between senior educators, tutors and students. How we get ourselves working together and how we get ourselves working in an integrated way to ensure one bigger set of interwoven conversations is a challenge (Tutor, Group interview).	The success of an informal technology distributed leadership relies on an integrated approach to engagement that brings informal leaders, tutors and students into the various encounters with and without technology and across different contexts
Enable	In Module 2, our (as project leaders) goals were similar to those of Module 1. We needed students to use blogs to reflect individually and collectively on issues discussed in face-to-face sessions (i.e. seminars) whereas Module 1 was topic and debate-centred so it made sense to use discussion forums (Interview with CET educational technologist).	Educators enabled student consummate engagement with technology by allowing them to interact collaboratively and reflect individually on content taught in class.
Enact	The course is trying to create an intellectually friendly environment and this has an impact on how we can ideally use social media. There are some contradictions between peer to peer learning and structured learning within a course – teachers are conceived as intruder in spaces like Facebook which students conceive as theirs. This brings the issue of whether there is a need for different kinds of spaces for different kinds of interactions or whether we need spaces which are particularly for peer-to-peer interaction, where the lecturers accept that we have no control here and let the tutor go and the lecturer stay out (Interview with CET educational technologist)	A holistic process of engagement that allows for the sufficient involvement of educators, tutors and students is critical to the successful sustenance of informal technology leadership regime. This system should consider the different roles and contributions of various stakeholders to the improved learning of students and improve the support mechanisms of educators.
Encourage	Where the global citizenship team are currently is critical if were were to recommend the use of social media into the course. I don't think that we need to go radical – like drop Vula, go into a cloud of Facebook ecosystem and Twitter. That would be useful for students but not for the bulk of staff. The GC-LSJ programme is a course and not a social network or a voluntary activity where we don't mind if the students drop out (Project leader, Group interview)	The culture of informal technology leadership demands sufficient recognition of different stakeholders' confidence with and familiarity with technology. An legitimate balance should be struck between them traditional and emerging technology adoption to support meaningful learning and collaborative learning-based ecological environment.
Evaluate	That is, while we want to promote critical engagement based on explicit use of concepts, it is not clear whether a movement to an online community is friendlier than Vula (i.e. UCT's brand of the learning management system) like social media will make students more relaxed, more emotive and dampen the conversations we expect students to generate (Course convener's view in a focus group discussion)	Technology adoption leadership emerges from educators' appropriate choices regarding technologies that student could optimally utilise to ensure that critical engagement
Emergent	What lessons were learnt through ongoing process of cycles of action research built on a participative action research methodology that enables improvement in implementation of technology adoption?	

institutional levels and *informal distributed leaders* at operational levels in the implementation of the GCLSJ programme.

Transactive ecological system
Once the senior leadership (i.e. Office of the Deputy Vice Chancellor) provided the fundamental institutional guidelines on community engagement that the GCLSJ programme was expected to cohere, the *informal distributed leadership* – the GCLSJ team – was tasked with implementing the programme. This arrangement coheres with Holt et al.'s (2014) recommendation that the building of distributed leadership should start through deliberative formal leadership commitment and action starting at highest levels of the institution because the meaning and value of informal distributed leadership tends not to be uncritically accepted. The role of informal distributed leadership was to use online and face-to-face interactions to foster an ecological system where all stakeholders

(senior educators, tutors and students) gainfully transact and exchange knowledge in an integrated ways. One tutor remarked:

> We need to develop an ecosystem of f2f and online interaction and mutual interaction and feedback between senior educators, tutors and students. How we get ourselves working together and how we get ourselves working in an integrated way to ensure one bigger set of interwoven conversations is a challenge. May be there are certain interactions that work better f2f – like sharing of educators and students' fears and anxieties but those conversations can continue online … (Tutor, Group interview).

The success of distributed leadership in implementing technology-enhanced academic programmes, therefore, hinges on identification of a shared vision for the programme and possession of technological capabilities to realise the vision. Different generations' orientations towards working collaboratively including the complexities of sharing fears and anxieties that could be inter-generational suggest the need for informal

distributed leadership to adopt technology and learning strategies skilfully to overcome intergenerational tensions. Murray (2011) documents how behavioural tendencies of a millennial generation (such as their inclination to collaborative work, multitasking, and having a more integrated view of the organisational hierarchy) including their heavy utilisation of technology may not only manifest as their leadership styles but may create tensions in a learning environment comprising multiple generations. As millennial and pre-millennial leadership, the informal distributed leadership would be called upon to resolve these tensions.

The distributed leadership had to draw on the aforementioned ecological system of social practices, pedagogical principles and contexts to create a dynamic learning system with various synergies. Creating this well-coordinated system overwhelmed the team:

> Co-ordination of different learning activities and technologies is more of a challenge. It is actually more about collaboration than co-ordination. It is about developing a shared game plan for course team who are operating in different environments. For example, if I am operating in both an online environment and f2f, I need a shared understanding of objectives and tools operating in f2f environments and vice versa. We need to have a shared understanding of the bigger vision of how these environments support each other (Project convenor, Group interview).

Educators' learning objectives, activities, varying levels of experience, use of technology, therefore, collectively shaped the informal distributed leadership's use of technology for student teaching and learning. The pedagogical value of a "shared game plan" lay in its potential to foster a common ground among educators on critical citizenship, community engagement and appropriate technologies to deploy in the successful implementation of the programme. The need for a shared vision and technology implementation plan mirrors Hauge and Norenes' (2014) finding that the successful implementation of open collaborative technology practices necessitates that the distributed leadership functions as a team-based and distributed activity, relying on educational and technological expertise at multiple levels. As the project leader acknowledged:

> There is a disjuncture between tutors' approaches and senior team members' conduct. Tutors tend to review their online facilitation processes and possibilities for improving them. They are good at integrating f2f interactions into online interactions. We as senior members of staff are either struggling or reluctant digital immigrants who do not use online environments much in a conversational way. We don't use social media that much, and are struggling to understand how to use online communication for real deep communication. The issue is not just the development of tutors but bringing in the whole team through a shift (Project leader, Group interview).

Although there was a shared vision about using educational technology to advance global citizenship and service learning, the implementation of this vision was challenged by the differential level of prior exposure and experience in using emerging technologies. We infer that generational gaps impacted educators and student orientations towards technology and their productive use of it for educational purposes. Reconciling of inter and multigenerational differences in senior educators, tutors, and students' use of technology is key to the success of informal distributed leadership's use of technology to enhance meaningful teaching and learning. This finding resonates with Murray's (2011) observation that generational traits of millennials might cause tensions in a multigenerational organisation and millennial leaders should play a key role in addressing pedagogical implications of these traits for their leadership initiatives. Acknowledging a systemic approach to distributed informal leadership, Spillane, Healey and Mesler Parise (2009) report that an exclusive focus on individual personalities (e.g. the school principal) substantially underestimates an organisational investment in institutional leader learning. They recommend a distributed leadership approach where school leaders' learning can involve the opportunities to learn from other formally designated school leaders (both administrators and teacher leaders). The informal distributed leadership of the GCLSJ demanded a consideration of their learning opportunities, their anxieties and challenges.

Overcoming differential participation

The implementation of the programme was constrained by the different disciplines from which students came. For instance, students who came from disciplines without a culture of argumentation were more challenged to articulate their views publicly than those from disciplines where critical engagement was the norm. As the course convener alluded:

> Some students come from engineering and commerce, which do not require many readings to draw on. The argument is how far tutors can guide discussions without being seen as dominating and constraining student activity. It is not about the technology but the way conversants talk to one another. It is the culture of argumentation in the social sciences where the discussions tend to be spontaneous and the idea is to spin off an argument in a particular direction and not necessarily in reference to previous points, message or the theory, etc. (Course convener, Group interview)

The diversity of disciplines from which students came combined with their different academic levels (from first year to PhD) further complicated the development of a shared understanding among students and educators. The different cultures of argumentation expected in different disciplines meant that different students psychologically accessed the conversations differently. As such, a contingent approach to informal distributed leadership that ensures all students, irrespective of their disciplinary inclinations or academic level sufficiently engage with peers, tutors and educators in online and offline environments was necessary. A contingent approach to informal distributed leadership takes a situation-specific and context-dependent stance to fulfilling its mandate by ensuring that: fitness for purpose, in a specialised context, and at a particular time are infused into the leadership frame (Lawson 2013). The approach needed to embrace student heterogeneity, disciplines' varying levels of critical engagement and temporal times of online and offline interaction.

Enablement

Under enablement, the *locus of control* and *alignment of technology* with *pedagogical intentions* and *technology integration* were discussed.

Locus of control

The informal distributed leadership's challenge was finding the locus of control to anchor students appropriately in pedagogical content knowledge. Educators were supposed to be conscious of academic circumstances under which academic authority could be shared with students without diluting the intellectual focus of the discussions and those under which academic authority could be reinforced. In particular, these innovative leaders had to strategically adopt collaborative educational technologies that would enable educators to pitch content delivery appropriately, and allow flexibility of the locus of control given to students in knowledge generation and exchange. As the educational technologist alluded:

> In Module 2, our (the GC team) goals were similar to those of Module 1. We needed students to use blogs to reflect individually and collectively on issues discussed in face-to-face sessions (i.e. seminars) whereas Module 1 was topic and debate-centred so it made sense to use discussion forums. So the question is where is the locus of control in these modules and how can it be pitched appropriately. In Module 2 the students were more in charge of how they presented their thinking. A tutor could ask a question but then students could come up with their reflections, which could be significantly different from the tutors' views, which would be ok. To the contrary, in Module 1 it would not be ok (Interview with CET educational technologist).

Since Module 1 emphasised student grounding in global citizenship, service and social justice issues, critical inquiry through the articulation of the theoretical knowledge formed the basis of this module. As such, Module 1 tended to follow a more systematic, structured approach to content delivery with educators taking a more proactive leadership role with regard to pedagogical content delivery, coordination of seminars, and student participation in discussion forums. While the distributed leadership anticipated Module 2 to involve critical inquiry as well, they deliberately adopted a hands-on approach among students by entrenching critical reflection via personal blogs and practically oriented approaches to service learning. Foregrounding different issues in different modules and systematically flexing the locus of control suggests that informal leadership constitutes a strategic intervention and rational decision making process. Conceiving leadership as an intervention means several choices regarding leadership strategy must be made and the multiple strategies they select must be synchronised and harmonised for consistency and logical implementation (Lawson 2014). This is critical for the two modules that were expected to run concurrently-allowing for critical inquiry, reflection and community participation in two different modules.

Pedagogical alignment

The alignment of technology with pedagogy necessitated that the content taught, pedagogical intentions of the

GC-LSJ Team and student learning activities cohere with each other. As one of the tutors emphasised:

> In social sciences, if students want to make moral judgements about something then they should provide evidence to back their arguments – the practicalities of university discourses. In discussion forums, however, they do not want to write pieces of text longer than a screen. So what we (i.e. tutors) are looking for are pieces or outlines of arguments rather than fully developed arguments though we want to see some logic such as evidence and conceptualisation (Tutor, Group interview).

Another tutor concurred, drawing on students' conversations in chat rooms:

> In chat rooms, students are acknowledging each other's existence by sending some short messages. They are saying bits about their experiences of the course and seeking help, giving information about learning activities. It's kind of informal peer support on general course management, identification of learning tasks (Tutor, Group interview).

We infer that the informal leadership's role was assigning academic activities that would cohere with their academic intentions and recommend appropriate technologies that effectively enhanced these activities. These challenges of integrating pedagogical activities into educational technology meant that educators needed to sharpen their pedagogical skills through continual training and development. As Creanor (2014) observes, for informal distributed leadership in technology innovation to be continually effective and for continuing academic engagement to happen, a clear pathway for the ongoing development of educators is required to leadership capacity in teaching and learning.

Technology integration

In this programme, the challenge of informal distributed leadership was how to integrate technology across online and offline learning spaces, drawing on generic learning principles while being mindful of varying contexts of student interaction. As the educational technologist alluded:

> The team's problem is how they can create an online system that combines the online and face-to-face conversations in such a way that the two reinforce each other. It is about integration of online and offline activities to develop ideas, better formulation of pedagogy and applying generic principles learnt to a specific context of courses in terms of their goals, student population and an evolving course team. It's really about application to context and not just parachuting principles acquired elsewhere and applying them here.

As Holt et al. (2014) suggest, distributed learning demands the skilful integration and mainstreaming of a range of emerging technologies into the curricula to promote innovative delivery, in addition to a cohesive organisational structure for the coordination and delivery of valued pedagogical resources for staff and students.

Evaluation

Evaluation related to making shrewd choices about appropriate technologies to adopt for the two modules.

Appropriate technological choices

Another complexity the informal distributed leadership was confronted with was how to make appropriate choices

between familiar, institutionally-adopted technologies (e.g. LMS, chat rooms, discussion forms and blogs) and experimenting with emerging technologies (such as social media). Since the role of educational technology leadership is to evaluate the educational value of existing and emerging technologies, and motivate colleagues to experiment with new technologies, the challenge was reconciling the academic potential of traditional, proven technologies with that of "yet-to-be-tested" emerging technologies. These leaders' uncertainty about combining different technologies was apparent:

> While we (project leaders) believe that students have shared understanding of concepts used in the course, there is some tension when we use social media. That is, while we want to promote critical engagement based on explicit use of concepts, it is unclear whether moving to social media is more friendlier than Vula (i.e. the university's learning management system), i.e. will it make students more relaxed, emotive and dampen the conversations we expect students to generate? (Course convener in focus group discussion).

The informal distributed leadership's dilemma was that for their technology combinations to enhance critical inquiry and open deliberation, their technology choices necessitated weighing up the potentials and risks of traditional technologies against the hopes of promising, yet uncertain technologies. Although social media were generally low skill intensive technologies and hence more ambient to students, their potential to generate emotive conversations among students was a risk educators were hesitant to handle notwithstanding the emotional nature of social justice and critical citizenship discourses.

Enactment
This issue revolved around reconciling authority with learning contexts and promoting a sense of shared intentionality.

Reconciling academic authority with learning spaces
If academic leadership involves the exercise of authority over students and influence over colleagues, then leadership is imbued with power struggles. One potential expression of power struggles between educators and students related to how educators would impose their authority in student-controlled spaces (e.g. Facebook). Therefore, the pedagogical challenge for the informal distributed leadership was whether they should engage with students, including the extent of authority they could exercise on students in student-regulated sites. As the educational technologist highlighted:

> The course envisages creating an intellectually friendly environment and this impacts on how we use social media. There are contradictions between peer-to-peer learning and structured learning within a course – teachers are conceived as intruder in spaces like Facebook which students conceive as theirs. The issue is whether we need different spaces for different kinds of interactions or we need spaces for peer-to-peer interaction, where lecturers accept that they to stay out and have no control and let the tutor go. Tutors are, in terms of status, stage of their lives and attitude, closer to students than lecturers. They are likely to trust the lecturers for intellectual stuff but personally find tutors more approachable than lecturers (Interview with CET educational technologist).

The latent power struggles were anticipated at the level of pedagogy, where the educators were uncertain about their presence and facilitation of discussions in Facebook discussion group. The various roles and responsibilities senior educators and tutors would assume in these student-regulated spaces were also open to contestation given that tutors were considerably more adept with social media technologies and identified with students more than their senior educators, notwithstanding educators' overall control of the GC-LSJ programme.

Shared intentionality
A critical component of distributed academic leadership is the need for core group members to possess a shared broader vision about their pedagogical intentions and technologies to draw on to achieve these intentions. Although the distributed leadership seemed to generally share the collective vision of advancing global citizenship and critical citizenship through critical inquiry and discourses on service learning and social justice, what remains uncertain was the means to achieve this reality. Senior academics and tutors seemed to have different levels of exposure, experiences and orientation towards technology.

> There seemed to be tensions between rhetoric and reality. For instance, tutors tended value online communication but I think that there were course management members who directly or subtly felt that face-to-face sessions were more important and online interactions were adjunct (Educational technologist)

Encouragement
Tacit power struggles
The GC-LSJ team experienced difficulty in enlisting student participation in the course. This is because although the GC-LSJ course would appear on individual students' transcripts as an extra-curricular course, no credits could be accumulated by students for participating in this course. This complicated the introduction of punitive measures on students who did not optimally participate in online learning communities introduced in the programme such as discussion forums and chat rooms in Module 1 and blog reflections in Module 2.

> Where the global citizenship team are currently is critical if they were to recommend the use of social media. I don't think we should go radical – like drop Vula (the institutional LMS), go into a cloud of Facebook and Twitter. That would be useful for students but not for staff. The GC-LSJ programme is a course and not a social network or a voluntary activity where we don't mind if students drop out. More so, the course is an addition to mainstream courses and students don't get credit for it. We are not sure whether students feel that it is a core course to do or whether they just want to be among their friends (Project leader, Group interview).

> Since this is a non-credit bearing course, this means that going to deeper levels of interaction and rigorous engagement, which involve more application of concepts is difficult to impose because there are no marks and credits. Part of student excitement in the course is because it is different from other courses where there is a strict curriculum and many readings and highly conceptualised interactions (Project convenor, Group interview).

The non-credit bearing nature of the course had implications for how much pressure educators could exert on students to enforce participation and student compliance with rules of engagement in online spaces. Student participation depended to a considerable degree on their personal motivation and devotion to critical citizenship and service learning causes rather than on educators' authority to regulate online interactions and enforce discipline for non-compliance.

Emergent issues

Although senior leadership had some latent influence in terms of the conception of the Global Citizenship programme (through their crafting of the programme at abstract, senior levels), the devolving of authority to the informal core group on the actual implementation of the programme was critical in ensuring the buy-in of multiple stakeholders (other academics, tutors, students). It was also self-evident that the effective adoption of emerging technology for the teaching of global citizenship required informal distributed leaders to foster an ecological environment based on the skilful integration of different learning environments (offline and online), with the appropriate sequencing of learning tasks and technologies. More so, the differential participation in the Global Citizenship course occasioned by variations in exposure and use of emerging technologies (especially social media technologies) by the informal distributed leaders meant that provision of technology-based training and professional development on the effective, authentic use of these technologies would be critical to ensure sufficient buy-in from all group members, the development of a shared vision in the implementation of programme activities and successful implementation of the entire programme.

Conclusions

As already stated in the objectives section of this article, the authors investigated the role and contribution of informal distributed leadership in:

1. The adoption of emerging technology in a Global Citizenship programme,
2. Navigating the complexity of implementing the programme for a culturally diverse, heterogeneous class.
3. Understanding informal distributed leadership processes in university's Global Citizenship programme.

From the empirical results as well as the literature, we conclude that *informal distributed leadership* enhances technology adoption but works best when there is a clear understanding of the: (1) locus of control of technology adopters; (2) power contestations between academics and students; (3) alignment of technology with pedagogical goals; and (4) shared intentionality between the core group of informal leaders.

Drawing on the overall objective of the programme, we concluded that the dedicated involvement of senior leadership in giving strategic direction to the programme (at conception level) and the unwavering commitment and buy-in of the informal distributed leadership through their execution of devolved authority ensured the successful implementation of the programme. However, we also observed the complexities of developing a shared "game plan" occasioned by variations in exposure and

competencies in use of emerging technologies among senior educators and tutors. This is in addition to educator concerns about the disjuncture between institutionally sanctioned technologies and those that students were familiar with and used in the programme. Lastly, these informal leaders were also ambivalent about the extent of their involvement in emerging technologies that student most preferred (e.g. social media) due to potential breaches of educator-student boundaries and uncertainty about the effecting authority in 'student-regulated' spaces.

Recommendations

Managerial implications

The findings and conclusions means that whilst informal distributed leadership can promote technology adoption, top managers in the HEIs need to realise that such an approach works best when there is a clear understanding of the locus of control of technology adopters. Secondly, top managers in the HEIs need to appreciate the power contestations between academics, tutors and students and they must devise means to control such contestation in order to smoothly introduce technology. Thirdly, top managers in the HEIs need to align technology with pedagogical goals of the university. Fourthly, top managers in the HEIs need to cultivate shared intentionality between the core groups of informal leaders. In practical terms, *informal distributed leadership* offers organisations including HEIs an alternative approach to the problematic issue of technology innovation diffusion that employs a middle-of-the-road approach instead of the top-down and individual innovative leader (bottom-up) approaches that have proven rather difficult to follow.

Implications for research

Although this study introduces a new dimension to the technology adoption discourse through the distributed leadership theory, the findings remain tentative that need to be validated from various angles including design, size of population and on a larger scale than the current one.

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