**Developing secondary schools as learning organisations: A systemic contribution**

**Abstract**

**Purpose** – The purpose of this paper is threefold. First, to explain the link between traditional same-age school structure and the impact this has on a school’s capacity for individual and organisational learning. Second, to explain why attempts to develop schools as learning organisations invariably reify existing structures and practices. Finally, to provide an example of how schools adopting a multi-age form of organisation (a vertical tutoring system) make the transition from a same-age operative structure to an embryonic form of learning organisation (LO).

**Design/methodology/approach** – This conceptual article is based on a critical review of the LO literature and focuses on the defining characteristics of the LO. The paper uses autopoietic theory to explain differences in learning capacity between traditional same-age schools (year or grade-based structure) and schools that have transitioned to multi-age organisation (vertical tutoring system).

**Findings** – The capacity needed for individual and organisational learning is reliant on an organisational structure that enables the agentic collaboration of participating actors (staff, students, and parents). However, the structural form of the traditional secondary has insufficient capacity to respond to increases in learning *demand*, one that threatens to overwhelm its system. Instead, such schools actively prevent agentic learning relationships from forming by *smoothing* demand on their system. Schools that aspire to be learning organisations are defined by the collaboration that their former same-age iteration suppresses. To increase their capacity for individual and organisational learning, they must deconstruct and completely redesign their existing communication and management system.

**Originality/value** – This conceptual paper argues that for secondary schools to develop any semblance of a learning organisation, they must abandon the restrictions on learning caused by their same-age form of organisation. The VT system provides the kind of organisational template needed.

**Keywords – Autopoiesis; organisational learning; learning organisation; vertical tutoring; secondary schools**

Jacobs (2019: 1) indicates that the rate of change invariably outstrips the rate at which individuals and organisations can respond. There is a compelling argument for saying that educational reforms never reach, much less influence, long-standing patterns of school practice let alone impact on organisational structure (Sarason, 1990; Payne and Kaba, 2001; Little, 2002; Cuban and Usdan, 2003; Elmore 2004; Fullan, 2009; Saltman, 2014; Honig 2020; Murphy. 2020). Murphy’s overview (Murphy, 2020) notes the inability of schools to listen to participant actors (especially students) and describes how school context ‘requires educators to bend reform lessons towards school rather than accepting lessons as they are or bending schools to those lessons’ (Murphy 2020: 11). Effectively, Murphy is describing schools as non-learning organisations, entities driven by their autopoietic structure (described below) that appear to subvert any reformational intention and so maintain sameness over time. A history of reformational failure does not bode well for legislations attempting to develop their schools as learning organisations despite the continued interest in the idea of the learning organisations worldwide (Hsu, 2021).

The introduction that follows sets the idea of the learning organisation within a wider problematic of the traditional *grammar of schooling* and reformational failure, positing the idea that the age or grade-based organisational structures integral to traditional schooling obstructs the development of agency to the detriment of individual and organisational learning (Cuban, 2019; Fullan, 2020a).

A review of the literature follows focusing on the learning organisation and the systemic challenge of the transition from the *complicatedness* of a teaching organisation to the *complexity* of a learning organisation. The review has three sections: (1) the challenge posed by structure and agency; (2) the key organisational features of a viable system model (3) the Welsh attempt to develop schools as learning organisations.

A third section explores autopoiesis to explain why the secondary school as a social entity is seemingly intransigent to reform. Although a controversial topic, autopoiesis provides insights that challenge widely accepted world-views of schools and how they operate, and their capacity to enable learning. Autopoiesis also explains why it is that schools appear to both embrace and nullify reform simultaneously.

A fourth section describes schools that have transitioned to a vertical tutoring system (VT). These schools maintain same-age classrooms, but their socio-learning relationships rely on familial multi-age tutor groups, a ‘house’ or nested structure, individualised support, and strong home-school collaboration. It is proposed that this tranche of schools has re-formed and constitutes an embryonic form of learning organisation.

Concluding remarks follow.

**Introduction**

Tyack and Tobin (1994) coined the phrase, *the grammar of schooling,* to describe the operational principles and constructs endemic to traditional same-age schooling, the dominant system-in-use. Subsequently, Fullan (2020) listed eight component features of *grammar,* which include a) batching of students by age, grade, and subject; b) ignoring or miscasting the inequity problem; and c) separation of parents/communities from schools. These contribute to what Fullan (2020) calls the ‘default culture’, one based on same-age organisation that ‘blunts any serious attempt at change’. Cuban (2019) posits that same-age structure stifles learning. For Cuban (2019), schools dissipate reforms rendering them ineffective, but why this occurs is uncertain. For Wolfe (2012), the explanation rests in a failure to shift from a corporate machine to a living entity, i.e., the autopoietic dispositions of social systems described below.

While much is said on the topic of *school reform*, current discourse (new public management) rarely escapes ideas concerning research-based learning, curriculum editing, system leadership, teacher accountability, and a much-vaunted ‘what works agenda’. The reductional pursuit of pedagogical laws means less is said about the organisational structure of schools, their formal bureaucracy, autopoietic nature, and structures of power that govern and sustain their operational form (Vanderstraeten, 2002; Laloux, 2014; Flood and Romm, 2018; Overwijk 2021). As such, legislations persist in trying to prod into life a corporate form of organisation that has changed little from its Prussian inception 175-years ago.

Kuhn (1962), in his discussion on scientific revolution, suggests two conditions for transforming the status quo. First, is the realisation that the current world view ‘is running into cataclysmic difficulties’; the second concerns the availability of an alternative model that disconfirms the world view and promotes the need for change. It is fair to say, as Fullan does (Fullan 2020a), that while we have the cataclysmic difficulties of traditional schooling, any viable alternative (such as the learning organisation) remains aspirational. There is a hiatus that requires resolution, a crisis of values and purposes.

**Literature review**

***1. The challenge of Structure, agency, and reciprocity***

For Pedler *et al*., (2006: 2), the LO ‘facilitates the learning of all its members and continuously transforms itself and its context’. The connection between the school as an adaptive entity and its capacity to faciitate individual and organisational learning is critical to the idea of the LO. While many advocate that schools develop along the lines of learning organisation (Silins and Mulford, 2002; Bowen *et al.,* 2007; Harris and Jones, 2018; Kools and Stoll, 2016; Senge, 2006), there is less certainty concerning what the transition from a teaching organisation to a learning organisation involves or looks like. At the heart of such an aspiration is a systemic problem regarding structuration, the reciprocal degree to which structure enables agency and agency develops structure. Schools must not only learn how to release the tacit knowledge and information that same-age structure locks-in, but simultaneously build the capacity to listen to the voices of the multiplicity of participating agents (staff, students, and parents). To respond to such an increase in information traffic, an organisation must re-form, i.e., substantially increase its capacity for individual and organisational learning. Although secondary schools entertain learning values in written statements of intent, policy reception for participating actors is tenuous in practice (Seashore Louis and Lee, 2016; Lumby 2019; Gowlett *et al*., 2015: 149). For example, schools claim robust systems of home-school partnership but experts in that field (see Breslin, 2021; Jeynes, 2011; Goodall, 2018; Epstein *et al*., 2011) highlight a considerable distance between policy and practice.

Watkins and Marsick (1993) see the LO as a system that combines structure and people, one capable of generating ‘new products and services’. This raises immediate challenges and a number of questions for secondary schools. To what extent are traditional school organisational structures capable of facilitating the collaboration involved in facilitating the learning needs of participant actors (staff, students, and parents)? How can a metrological system dependent on standardised performance data and designed for curriculum delivery purposes, deconstruct and evolve into a form organisation no longer easily controlled and measured by the centre? What, exactly, are the new *products and services* we should expect?

Senge (2006: 3) suggests that the LO is an antidote to ‘the illusion that the world is created from separate, unrelated forces’ offering the following defining characteristics:

[…] organisations where people continually expand their capacity to create the results they truly desire, where new and expansive patterns of thinking are nurtured, where collective aspiration is set free, and where people are continually learning how to learn together.

Although Senge (2006) delivered the vision and concomitant parts (systems thinking, personal mastery, mental models, building shared vision, and team learning), he failed, like Moses, to lead his systems thinking tribe into any Promised Land. However, the implicit characteristics (learning, developmental values, collaboration, aspiration, agency, and betterment) continue to resonate with reformers in their desire to *make a difference*, and with school practitioners striving for authenticity, recognition, and purpose.

Unsurprisingly, the challenges of conceptualising and interpreting the ideas behind the learning organisation as a viable operational construct continue to be problematised in the literature (Grieves, 2008; Seddon and O'Donovan, 2010; Caldwell, 2012; Örtenblad, 2018; Field, 2019; Antonacopoulou *et al*., 2019). Direct criticism comes from Caldwell (2012: 17) arguing that Senge's idea of a learning organisation should be ‘abandoned as a vision of organisational change and human agency’. Örtenblad (2007) refers quizzically to ‘Senge’s many faces’, and their interpretation, while Seddon and O’Donovan (2010) ask why learning organisations have yet to materialise and why so few envisage themselves working in such places.Pedlar (2017: 198) notes that while the idea of the LO ‘had some impact in the 1990s […] there is scant evidence of their influence in the managed world’.

The literature suggests that the odds are stacked against schools becoming LOs. Field (2019: 1108) argues that the concept of the LO has deteriorated into a ‘smorgasbord of terms and concepts from which different investigators can take their pick while asserting that their choice represents the essence of the learning organisation’. Field (2019) identifies three challenges and advises schools to ‘ignore calls to become learning organisations,’.

First, there is no agreement about what the phrase 'school as a learning organisation' means; second, most accounts of schools as learning organisations adopt an unrealistic, apolitical perspective on school improvement that ignores the impact of interest differences on willingness to share learning; and third, much of the scholarship advocating that schools operate as learning organisations is of poor quality.

***2. The search for a viable learning organisation***

Örtenblad (2004) suggests that the LO comprises ‘four aspects’ applicable to schools, “learning at work, organisational learning, developing a learning climate, and creating learning structures”, positing that only organisations which demonstrate such aspects should be considered learning organisations. Later, Örtenblad (2018) further qualifies the ‘*organisational aspect’* of the learning organisation, whereby the organisation (a) facilitates learning, (b) creates a climate of learning, (c) enables organisational learning (citing Easterby-Smith, 1997; Popper and Lipshitz, 2000), and (d) has an ends-orientated process that enables flexible and interchangeable use of knowledge.

For Örtenblad (2018), the school is social in form implying the collaboration of participating actors (staff, students, and parents). Together, they comprise the social context and cognitive learning units. To enable increased collaboration requires schools to reorganise their communication system. If they are to listen to and involve the multiplicity of agentic voices, they must increase their organisational capacity for individual and organisational learning. Such a change means transitioning from the complicatedness of a technical rationalist system to one more complex adaptive (see Dooley, 1997; Gell-Mann and Lloyd, 1996; Glouberman and Zimmerman, 2002; Ashby, 1956; Beer, 1972), a reappraisal of the way schools manage and leaders lead. Synthesising information in learning networks is not achievable using the linearity of centres of control, restricted access rights to information, data storage systems, and rules-based measures of accountability. A learning organisation is reliant on the distribution of leadership to the organisational edge and a liberated management structure, a reversal of the way information normally flows in a school’s system (see Lumby, 2019).

It is no surprise that much of LO literature is concerned with the modelling requirements and communication processes needed to develop a LO. Antonacopoulou *et al*., (2019) suggest salvaging the concept of the LO and morphing it into the *New Learning Organization* something they describe as a *Sensuous Organizational Learning Framework, one* characterised by institutional reflexivity, high agility organising, and learning leadership. For Antonacopoulou *et al*., (2019) these lead to new ways of knowing and acting, a theme explored by Shaked and Schechter (2020). How such transformative learning and the reflexivity needed occurs and the practical form of any resultant (new) learning organisation is largely unexplored.

Shih-wei [Bill] Hsu (2020) proposes three problematics that organisations (like schools) must overcome. First is resistance or inability to change. In this case the only recourse is to assimilate and reduce any LO characteristics using its existing operational platform. The effect is to reify rather than change its mode of learning (Örtenblad, 2015; Pedler and Hsu, 2019). In such a case, rationalised assimilation negates the need for critical reflection and profound organisational discourse (Antonacopoulou *et al.,* 2019). The effect is to view LO characteristics as a tick-box exercise in compliance whereby policies are rewritten but no substantive relational/organisational change occurs. The second challenge involves developing the capacity to handle an exponential increase in learning traffic created by a multiplicity of participant voices (staff, students, and parents) otherwise heard, i.e., how to turn stakeholders into process participants. The third challenge concerns the development of the LO as an interconnected social system. While the research literature is confident in setting out the theoretical characteristics of the LO and possible fault-lines, it is unclear on the actualité, a description of an alternative viable system that can stir reflexivity.

The meta-analysis of Thomas and Allen (2006: 129) identifies five attributes of the LO.

* Synthesis of individual and organisational learning
* An enabling structure
* Shared vision and values expressed through a reimagined mindset of the organisation
* A means of capturing information and knowledge
* An enabling strategy to increase the competencies of participant actors

To ‘demonstrate’ these attributes, schools must have a clear idea of how to construct and manage an ‘enabling structure’ and the staff development on which the other three attributes rely. Together, such features point to the primacy of social organisation and the degree to schools can liberate complex agentic relationships (staff, students, and parents) to provide coherent feedback mechanisms capable of harvesting, synthesising, and storing the tacit knowledge and information needed to promote learning. The organisational challenge is to construct an organisational form with sufficient capacity to cope with the complexification emanating from a multiplicity of voices and learning inputs. Consequently, any transition from one system to another must be preceded by a meaningful change in organisational mindset and openness to perturbation.

Thomas and Allen (2006) imply three interrelated problems regarding organisation with regard to schools. First, while so many are critical of the *default model* there is no systemic analysis (critical reflection in part) to explain how the same-age structure has retained its dominance for the best part of 175 years. Second, the absence of a viable system template creates the belief that existing same-age structure can yet be made to work through hard work, improved teacher training, new forms of leadership, a refreshed curriculum, pedagogical innovation, vastly increased resources, competition, new types of school, and a self-improving school system (Hargreaves, 2011). So far, the promotion of distinct types of school and multi-academy trusts has resulted in marginal gains at best (Godfrey, 2017; Greany and Higham, 2018; Babb and Associates, 2019) with no recognisable impact on the way schools organise their human resources and release agency. There is little evidence of transformative learning, critical reflection, or any substantive increase in organisational consciousness; consequently. Without a revised template (like VT, discussed below) the way schools operate and the underlying organisational assumptions on which they rely remain unchallenged.

***3. The attempt by Wales to re-form schools as learning organisations***

In their description of ‘developing schools as learning organisations’ in Wales, the OECD (2018) designates seven dimensions (characteristics or elements) and five strategies (Kools *et al*., 2020):

* developing and sharing a vision centred on the learning of all students
* creating and supporting continuous learning opportunities for all staff
* promoting team learning and collaboration among all staff
* establishing a culture of inquiry, innovation, and exploration
* embedding systems for collecting and exchanging knowledge and learning
* learning with and from the external environment and larger learning system
* modelling and growing learning leadership.

These elements, influenced by the *Dimensions in Learning Organizations Questionnaire* (Marsick and Watkins 2003) are the scaffolding for the organisational architecture needed for a learning organisation. As such, they signal the need for significant changes to learning relationships among participating actors, and an increase in what Laloux (2014) calls ‘organisational consciousness’. However, the absence of a viable system template leaves schools with no option other than to make minor modifications to their existing management platform, and so miss the opportunity for significant organisational reform. Without reflexivity and deconstruction schools have little choice other than treat the seven dimensions more as a tick-list exercise that shores-up institutional mumpsimus rather than one that excites transformational change. The task of adapting the seven dimensions of the LO to an existing organisational structure becomes a process of linguistic rationalisation and requalification of semantic meanings. A revised rhetoric reduces and redefines the LO characteristics to suit the existing system, treating the complexity of transition (see Stacey, 1995; Pflaeging, 2014; Laloux, 2014; Jacobs, 2019; Barnard 2021a) as complications to be managed and assimilated, rather than an opportunity for reform. Instead of developing schools as learning organisations, they become more intrenched teaching organisations.

According to the OECD (2018) the Welsh model requires four transversal themes to sustain itself: *trust, time, technology, and thinking together*. Given claims that many of its schools are ‘well on their way’ (OECD, 2018) to developing as learning organisations, it is reasonable to expect that the learning (Senge, 2006; Antonacopoulou *et al.,* 2019; Thomas and Allen, 2006, above) are in place. There should be evidence of reflexivity (not just consultation), transformative learning (Mezirow, 1990; Jacobs, 1919), organisational consciousness (Laloux, 2014), an enabling culture (Thomas and Allen, 2006), distributed leadership (Lumby, 2019), and a substantive shift from single to double loop learning (Argyris and Schön, 1974 and 1978). Unsurprisingly, the OECD evaluation (OECD, 2018) of the Welsh initiative notes that secondary schools find the dimensions challenging to implement pointing to an absence of critical reflection.

Unfortunately, the history of reformational failure suggests that schools steeped in same-age structures unconsciously mitigate the impact of reforms by assimilating them into existing work patterns or outright rejection – often when the resources provided for the reform cease. Proposed changes are disarmed in two ways. They are either subsumed into existing organisational patterns where they are diffused and controlled or they are rejected (see autopoiesis, below). Both ensure that the school as an organisational entity continues without hindrance to its operational structure. Without an alternative multi-age template reformers fail to see that the same-age hypothesis on which school organisational assumptions rely, is a major obstruction to individual and organisational learning. As Shaked and Schechter (2020) note, a systemic perspective is often absent from the DNA of leadership.

The Welsh approach aligns itself to a contextual form of the learning organisation (Örtenblad, 2018) and begins by establishing reasonable criteria to guide how a school might operate to increase individual and organisational learning. However, there is a systemic issue that prevents same-age structure from developing as learning organisations. Metrological systems like schools, “co-evolve in paradoxical and complex ways with their environments over time, and therefore amass stability and inertia” (Overwijk, 2020). They are effectively embedded in rules-based bureaucratic systems of assessment and evaluation that are themselves immobile (see Bowker and Star, 2000; Coppieters, 2007; Lumby, 2019; Overwijk, 2020). What is admirable about the Welsh initiative is to expand the learning focus from the pedagogy of the classroom (what we are told ‘matters’) to a broader pedagogy of schooling and the cultural attributes needed to promote individual and organisational learning.

**The autopoiesis of school**

Before looking at VT as a template for the learning organisation, it is helpful to reconceptualise organisational behaviour and the seeming intransigence of schools to reformational ideas and change processes. Both Cuban (2019) and Fullan (2020) are critical of the same-age system and note how quickly reforms dissipate in schools.

Autopoiesis is a metaphorical concept that highlights organisational behaviour within a social system like a school and an explanation of why such an entity (living system) responds to external perturbations like system change in the self-protectionist way it does. It also explains the presence of linguistic and rhetorical rationalisation regarding value claims that are inconsistent with operational practice. It further suggests that the focus on classroom pedagogy, leadership, and curriculum (single loop learning) as ‘school improvers’ deflects attention from addressing same-age structuration (double loop learning), the ghost in the school machine.

Autopoiesis as abstracted from the work of Chilean biologists, Humberto Maturana and Francisco Varela and refers to recursivity, the way living systems (re)-produce themselves (Maturana and Varela, 1980). Atkinson (2015: 18)describes five characteristics paraphrased here for schools:

* Everything the system (the school) does hinges on the preservation of the system’s identity, how it perceives and rationalises its-self.
* The system is self-constructing. A school decides how far it can push itself according to what it feels is safe, defining its own limits. It is self-protecting and risk-averse.
* The system understands itself by what it knows and has learned from experience. It is self-referencing and understands the ‘now’ by what has happened before.
* The system is autonomous. All functions work to maintain the system and ensure its survival and identity.
* The system is closed. It needs minimal external input and is invariably antagonistic and suspicious towards any external perturbation that may impact on its survival and (re)-productive capacity.

Such descriptors counter the (rationalised) claims to learning and openness that schools make. Further, they suggest that survival, not individual and organisational learning, is the school’s driving force. by schools and to (say) collaborative partnership with participating actors. To survive and re-produce itself the school exercises tight control over agency and disturbances likely to disrupt the way it has learned to operate. Luhmann (1995) goes further, dissociating humans from system construction; “social systems are not composed of psychic systems, let alone of bodily human beings” (Luhmann, 1995: 255). It is the system itself that determines the behaviour and extent of agency of those acquiescent to it. To join a school is to take up membership of a club where the rules and structures of power are clear. As Barnard (2021) says, it is questionable whether school leaders dictate the behaviour of the system, or (more likely) the system dictates the behaviour of school leadership. Overwijk (1921), commenting on Luhmann’s work (Luhmann, 2012: 34), notes how ‘bureaucratic techniques of classification, standardisation, and commensuration’ ensure operational closure that works to *smooth* or reduce complexity rather than absorb it. A recursive autopoietic system perceives external demands or perturbations involving transformational change as irritations to be either rejected or assimilated and dissipated, always ensuring that it can maintain its (re)-productive purpose.

Schools maintain stasis by producing a nuanced form of rationalised communication constantly redefining what they do and why, always ensuring that the immediate environment is commensurate with existing structure (Overwijk, 1921). Schools exercise semantic control over agency by limiting what counts as assessment, the content of school reports, what it is to ‘care’, how home-school collaboration operates, how much time is allocated, what should be measured, what constitutes curriculum, and more; a system that drowns dissenting voices of other actors in linguistic manoeuvring. The autopoietic effect is to offer an impression of change and progress while ensuring that systemic fundamentals and structures remain untouched by time (Weicks and Westley, 1996; Betts 1992; Banathy, 1991; Magalhaes and Sanchez, 2009; Bunyard, 2010; Cuban, 2019).

Fullan (2020a: 11) posits four ‘wrong drivers’ (academics obsession, machine intelligence, austerity, and fragmentation) he describes as a ‘bloodless paradigm’, one ‘lacking care, empathy, and civic awareness – the things that make us human’. Instead, Fullan (2020a) proposes four ‘right drivers’ — wellbeing and learning, social intelligence, equality Investment, and *systemsness* — something he calls ‘work in progress’. Fullan (2020a: 33) describes *systemness* ‘as the sense that people have at all levels of the system that they are indeed the system’ i.e., to be an active party in a learning organisation.

Autopoiesis, however, suggests cognitive dissonance, a conflict between the aspiration for authenticity and a system concerned only with its own survival and (re)-production. Autopoiesis suggest that schools maintain near feudal control over membership where participating actors must accept the house-rules they are unable to influence; participating players are not the system in Fullan’s terms but maintainers of the system’s means of re-production. As Fullan (1920: 34) notes, the system or ‘systemsness’ is the ‘meta-driver’ and understanding system behaviour (organisational consciousness) is all important if the cognitive organisational dissonance associated with autopoiesis is to be addressed.

Autopoiesis effectively challenges the world-view of schools as open, collaborative, inclusive, individualised learning systems reliant on partnership and capable of environmental adaptation. What schools say and express as the rhetoric of policy, and what they practice continue to drift apart, tenuously held by stretching the meaning of the words that schools use. This is the conscious and unconscious reasoning described Dick and Dalmau, (1990) and the theory espoused and theory in use (Argyris, Putnam, and McLain-Smith, 1985 : 82; Argyris and Schön, 1974; Argyris 1987: 93). Autopoiesis offers an explanation of the same-age mindset and the school’s (not the participant actors) seeming ambivalence to reform.

**Vertical Tutoring (VT) as a viable system template**

VT is under-reported and often assumed as a minor change to a school’s pastoral system to promote a familial atmosphere, improve behaviour, increase mentoring opportunities, and improve home-school communication. Like all reformational changes, schools can quickly absorb VT, reduce its potency, and maintain structure. While it is convenient to divorce VT from the primacy of individual and organisational learning, the two are inextricably linked. VT is what Fullan (2020: 33) calls a meta-driver, an alternative to the same-age system. To transition to a VT system, school leaders first develop a reflexive awareness of systemic autopoiesis and its limitations Barnard (2018), a sense that their same-age system places limits on learning.

Advanced VT schools deconstruct and abandon same-age organisation and co-construct a revised form of organisation based on multi-age tutor groups while maintaining same-age teaching groups. As such, they adopt the organisational philosophy of (say) Montessori, Steiner, Freinet, Maverick, and Jenaplan schools by facilitating the optimal development of individual and organisational learning. There are few examples of schools that might consider themselves learning organisations. These include the grade 7-12 ‘ESBZ’ school in Berlin where ‘children continuously toggle from being learners to being teachers’ (Laloux, 2014: 95), a place where learning responsibility is shared by participating actors. The organisational visionary, Ricardo Semler (2001) founded Lumier Schools, one where tutoring and teaching combine, age-grouping made obsolete, and an enabling and individualised structure built.

Vertically tutored schools, too, make fundamental changes to the way their socio-learning architecture works introducing multi-age tutor groups for a brief time each day. They reduce the size of tutor groups (around 18-20) and redeploy all school employees including school leaders and non-teaching staff to active tutoring, i.e., two tutors per group for around 20 minutes each day. This allows schools to build an interconnected socio-learning architecture based on a collaborative partnership between participant actors (staff, students, and parents). The result is a multiplicity of sense-making voices engaged in deep learning conversations. Altering the social organisation of the school ensures that leadership is redistributed to enable staff, students, and parents to participate in the learning process. The effect is to reinstate all information feedback loops.

The creation of such groups set in motion a domino effect that recasts and reroutes the school’s communication system ensuring that ‘the system espoused’ is aligned to ‘the system in use’. For example, to facilitate discussion and sense-making among participant actors (staff, students, and parents), a school’s assessment system requires fundamental alteration and retiming. To enable agency to better inform structure, the system redistributes leadership and trust to the organisational edge and the training needed. The reconstituted learning networks not only release information and tacit knowledge (complexification) but absorb and synthesise what is relevant (see, for example, Ashby, 1956; Glouberman and Zimmerman, 2002; Luhman and Boje, 2001; Tsoukas and Hatch, 2001; Barnard, 2021).

Given that, ‘same-age structure is inconsiderate of psychology and customer care, assuming of values, and unable to cope with complexity’ (Barnard, 2013: 38) VT is a multi-age organisational system that is complex adaptive and complexity dependent. VT incorporates deep learning conversations between tutors, students, and parents at all critical learning times, serviced by a redesigned reporting system, one based on the learning needs of participating actors rather than standardised data requirements. Tutor time is devoted to socio-learning conversations guided by the academic calendar, redefining what it is to care while always supporting and individualising learners. Every child is a mentor and mentee within an empathetic and learning culture, reducing the need for pro-social programmes. Developing a multiplicity of social groups releases the agency needed for individual and organisational learning simultaneously providing the capacity to cope and inform structure. As such the embryonic VT system meets the requirements of the learning organisation described in the meta-analysis of Thomas and Allan (2006) and others. Importantly, VT provides a viable system template that enables school leaders to stress-test their existing level of organisational consciousness.

**In conclusion**

While many schools in the UK and Australia have adopted VT, most fail to develop or see their systemic potential. Others are returned to their original same-age system when a new headteacher or CEO arrives. There is no infrastructure to challenge the existing ideology of leadership and management and the power structures described by Flood and Romm (2018). Every attempt at making the same-age system work better through revised policies, procedures, principles, protocols, and training and inspection merely reifies existing practice. The autopoiesis of leadership like the autopoiesis of schools, is highly resistant to change and low on organisational consciousness. Surviving rather than learning is the driver.

Otherwise, an ecological, aspirational, and almost spiritual perspective resonates throughout much of the LO literature (Egri and Pinfield, 1996; Weick and Westley, 1996; Porth et al., 1999; Howard, 2002: pp. 230-242; Sorakraikitikul and Siengthai, 2014: 175-192; Flood and Romm, 2018: p. 267; Laloux 2014) creating considerable interest and debate while trying to highlight the human condition in organisational theory and practice. There is one overriding conclusion; if secondary schools are to release and then absorb the complexity of learning demand on their system as they should, their form of organisation must be equally complex (see Ashby, 1956, Law of Requisite Variety; Beer, 1972; Betts, 1992; Banathy, 1992, Barnard, 2021). To achieve this means exposing the underlying frailty of traditional organisational assumptions and addressing the way schools communicate with themselves and others. As Harris and Jones (2018: 353) said, ‘subscribing in a genuine way to the idea of a learning organisation means that disruptive change will inevitably follow’.

The autopoietic nature of the traditional same-age school structure is to reduce or smooth the learning load that threatens to overwhelm its corporate bureaucracy. Lacking network capacity, the school closes the system to prevent overload. Instead of being complex adaptive, the school is complex averse. A multi-age VT system is an open system that releases tacit knowledge and information by enabling a multiplicity of agentic networks to form, simultaneously increasing its capacity to absorb such complexity and learn. As such, it is complexity-dependent. Effectively, VT enables reciprocity between structure and agency by liberating management and rewriting the grammar of schooling.

Lumby (2019) explains how easily schools are persuaded to adopt virtuous characteristics (like those of a learning organisation) by simply laying claim to a tick-list of attributes. To do so, merely reifies the existing grammar of schooling avoiding the pain of reflexivity. Such schools will claim the need for more resources to resolve their learning capacity issue rather than risk organisational change that dismantles what has taken a century to build. Schools that have decided to abandon the frailties and limitations of same-age organisation and transition to a VT system and a learning culture, are collaboratively well-placed to aspire to the idea of the LO and develop the authenticity, inclusiveness, and equity that schools and their communities crave.

As Robert Persig (2006) intimated, to avoid repetition of the past it is the rationality behind a system that must change. Without a revised thinking framework secondary school structuration remains implacably unresolved. Reforms do not change schools, rather schools change reforms, and as Nevis *et al*., (1996: 11) put it, ‘butterflies are not caterpillars with wings strapped on their back’.

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