Leadership and Reshaping Schooling in a Networked World

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***Abstract**: This paper is initiated from a position that, until recently, the nature of schooling globally has remained largely unchanged since its design in the last century, and there has been a hegemony that supported its form to be enduring and largely unchanged. However, in a digital, networked world, there is a need to rethink and redefine schooling. Following an examination of schooling in the 21st Century, summarising the context and critical challenges presented by new and emerging digital technologies, suggestions about what schooling might look like in an increasingly digital, networked world are presented. Guidance is provided in relation to key questions for leadership to reshape schooling in a networked world, including: how might schools move into the networked mode? what is required to lead and manage a networked school community? how will a networked school become defined less by its physical space and timetabled lessons, but by being networked and that learning can take place anywhere, anytime?*

***Keywords:** digital technologies**;** leadership**;** networked school community**;** networked world**;** school evolution**;** digital normalisation*

1. Introduction-Schooling in the 21st Century

Schooling in the 21st Century has the potential to be markedly different from that of the previous century, due largely to the immense technological changes. The challenge and the opportunities are summarised effectively by Johnson *et al*. [1]:

> *creative institutions are developing new models to serve students, such as providing open content over the network. ...Students can take advantage of learning material online, through games and programs they may have on systems at home, and through their extensive—and constantly available—social networks. The experiences... tend to happen serendipitously and in response to an immediate need for knowledge, rather than being related to topics currently being studied in school. ...having a profound effect on the way we experiment with, adopt, and use emerging technologies.*

The evidence of the major technological changes and the changes occurring in schooling are underpinned by the shift to digital technologies that are increasingly networked. This calls for strategic

leadership, based upon sophisticated understandings of this shift, and this paper aims to progress the conversation about rethinking and redefining schooling in our networked world.

This has been conceptualised here by considering that renditions of schooling tend to refer to a physical space and place, where an institution is visible in terms of its architecture, and where staff and its students attend for the purposes of curriculum, assessment and pedagogy. However, in a digital, networked world, in which many young people have long since normalized the use of digital technologies [2,3], those digital technologies provide the catalyst for questioning how, when, where and why learning and teaching should take place. This normalization has been largely influenced in recent times, not by leadership from schooling systems, but through consumerisation. In relation to business, whereby business attempted to lead the technological innovation, Mukerji [4] argues that, "the business led innovation dynamic has flipped; today, the most innovative technologies are emerging from the consumer side".

Mukerji [4] refers to numerous examples of disruptive technologies characterised by consumers driving the changes. To illustrate, the "viral popularity of Facebook, which is now approaching a mind-boggling 1 billion active users, has taught enterprises that there is business value in social networking". We are witnessing unprecedented technology uptake beyond educational institutions with Dahlstrom [5] noting that, according to Gartner estimates, "515 million smartphones and 131 million tablets were sold by the end of 2012". According to Dahlstrom [5], "This 'consumerization of technology' is setting a precedent in which students, faculty, and staff use their own devices, software, apps, and cloud-based technology to create a personal computing environment". Accompanying these major shifts, driven by consumerisation and normalization of the personal, digital devices by young people, considerable research interest and literature has emerged in relation to online learning, elearning (electronic learning), mlearning (mobile learning), blearning (blended learning), and ulearning (ubiquitous learning) approaches.

It is possible to suggest that these two assumptions imply a technological determinist perspective, by interpreting them as meaning that the purpose of schooling is to prepare students for a future in which digital technologies enable economic advantage in a marketised world. While decisions about education and technologies are likely to be situated within a global knowledge economy, networked school communities opens up, rather than diminishes, dialogue about the broader purposes and possibilities of schooling. For example, networked school communities provide space and opportunities for discourse about improving equity and excellence in schooling.

A scan of this literature suggests that the potential for leveraging from these technological changes is no longer being driven by educational thinking and large institutional thinking and systems, but by the transformational thinking by those outside of the education systems. Examples include the rise of social media, the impact of Google, innovation by companies such as Apple and Samsung, technological innovations evident in the health professions, new models of doing business, success of creative individuals and innovation "skunkworks". In essence, innovation is occurring beyond schooling, and often the disruptive innovation is generated by smaller, rather than larger units, such as small ideas-focused project teams. May [6] clarifies skunkworks:

Over the years, the term skunkworks has come to refer to any effort involving an elite, special team that breaks away from the larger organization to work autonomously on an advanced or secret project, usually tasked with breakthrough innovation on limited budgets and under aggressive timelines.

May reinforces the value of skunkworks by referring to Steve Jobs who "cherry-picked a team of about 20 'pirates' as he referred to them, and seceded from the Apple main campus", and believed that "it's better to be a pirate than join the navy" [6]. Jobs needed "talented but audacious individuals who could move fast and get things done" [6].

While the achievements of current schooling structures are acknowledged and valued, there is evidence of schools referred to in this paper as "pathfinders" in schooling contexts where leaders are pushing the boundaries, and have some understandings of the changes occurring outside of schools. These "pathfinders" align with our explicit advocacy for educators to take advantage of the rapidly changing technological landscape to shape the future, and to control the narrative, by rethinking the nature of schooling.

Schools now find themselves situated in a fundamentally different, digital, networked and global environment that differs from the 19th and 20th Century in which many of our current systems and structure of schools were conceived and shaped. As the "place called school" goes digital, it experiences similar transformations that other organisations, for example, in industry, business, and government, have experienced. Consequently, this requires education policy makers, schooling systems, and school leaders to revisit, rethink and redefine the concept of the school and the nature of schooling. This needs to be underpinned by an examination of the appropriateness and effectiveness of the schooling provided to young people in an increasingly networked world.

Therefore, this paper continues the conversation that is initiated from a position that the nature of schooling globally has, until recently, remained largely unchanged since its design in the last century, and that there has been a hegemony that has supported its form to be enduring and largely unchanged. However, it is noted that there are new ways of conceptualizing schooling, and that "pathfinders" have been evident. For example, as discussed elsewhere [3,7,8], those early adopting, pathfinding schools across the developed world have moved schooling from the traditional paper based operational mode to one that is digital, and they reflect the shift to becoming networked school communities. Following a reexamination of what is a school, and the context of new and emerging digital technologies and the critical challenges, what schooling might look like in a networked world is examined, and the conceptualisation of a networked school community is proposed. This paper adopts Mishra and Koehler's perspective [9] that teaching with technologies is a "wicked problem", drawing upon Rittel and Webber's [10] distinction between "wicked problems" and "tame problems". Wicked problems are characterised as being incomplete, contradictory, changing, and occurring in complex and unique social contexts. Solutions are often unable to be "right" or "wrong", but, for example, "better" or "not good enough", and involve engaging "expert knowledge to design solutions that honor the complexities of the situations and the contexts presented by learners and classrooms" [9].

To summarise, this is an important moment to reflect on the concept of schooling and the transitions underway in a networked world that provide some guidance for leadership and reshaping schooling in a networked world. In examining the evolution of schooling over the past decade, the work of Lee [11] and Twining [12], in their attempts to conceptualise possible explanations of the transitions through evolutionary stages of schooling, are both drawn upon. To conclude, the paper highlights that this continuing conversation enables a focus on the possibilities and potential of digital technologies for the learning of young people, through revisiting fundamental questions, such as—Are schools appropriately designed for 21st Century learning and teaching? Where and when does learning take place? What are the implications of elearning, mlearning, blearning and ulearning? What

constitutes a school in a networked world where students no longer have to physically attend to be taught and to learn?

2. Digital Technologies and Reshaping Schooling

Goodlad [13], in his seminal work A Place called School provides powerful messages based upon the premise that America's schools were seen by Goodlad as being in crisis and he warned that some might not survive. From this premise, Goodlad concludes that, "to think seriously about education conjures up intriguing possibilities both for schooling and a way of life as yet scarcely tried" [13]. More than 25 years later, schools are still largely defined as a physical place where students enrol and attend classes, consistent with the definition located in the Collins Dictionary, which states that a school is, "An institution or building at which children and young people under 19 receive an education" [14]. Similarly, Wikipedia defines "a school as an institution designed for the teaching of students (or pupils) under the supervision of teachers" [15]. Interestingly, the first of those two definitions focuses on the "building" or physical entity. While the second definition does not necessarily refer to physical spaces, such as buildings, neither seems to be inclusive of alternative models of schooling, and neither refers to the important purposes of schooling, other than "receive an education".

A Google search of "schools" and "schooling" revealed the emergence of "virtual schools", "schools of distance education", "online Universities", and "home schooling". Therefore, there is no evidence of education authorities, systems and schools exploring options and affordances of new technologies and new ways of defining schooling through expanding opportunities of when, where and how learning takes place. The move to online learning has accelerated in the Higher Education sector, driven to a great extent, by the quest for attracting student enrolments and by pedagogical advantages not able to be provided through only face to face teaching. School systems have similarly responded to the social pressures and parental expectations relating to access to digital technologies which provides marketing attractions to maintain or increase enrolments.

Many schools in the developed world are moving to take advantage of digital technologies, with financial support being provided by their Governments, as education policy is seen as being linked to economic policy and productivity. Digital technologies are "now seen globally as essential to a country's economic success" [16]. Simultaneously, as this is occurring, access to technologies in schools has been more than matched by student access to digital technologies in their homes and for personal use.

Students, in many instances, are increasingly expressing their desire for their digital capability to be used in and out of the school. In the Project Tomorrow report, *From Chalkboards to Tablets: The Emergence of the K-12 Digital Learner Speak Up 2012 National Findings K-12 Students* [17], data showed that students in schools have increased access to devices which have generally been personally acquired, reflecting the consumerisation driver, and have not been school acquired. That report notes that, "The rate of proliferation of those personal devices, most notably tablets, has also been evidenced by the Speak Up data. …Despite this proliferation of mobile devices in the hands of students, schools are still reluctant to allow usage of such personal devices" [17]. Disturbingly, only 9 percent of all students indicated that they could use their personal tablets at school. Similarly, in relation to laptops, while 73 percent of high school seniors reported that they had their own laptop, only 18 percent of them indicated that they were allowed to use their personal laptop at school.

This evidence suggests that leadership requires increasing understandings of the dynamically changing context of students' personal access to technologies beyond "a place called school", more

sophisticated understandings of drivers for change beyond educational institutions and systems, and the changing expectations that learning can be made available anywhere and anytime. These challenges present opportunities for leadership and reshaping schooling, which will build upon, and, in some instances, transform legacy structures and organisations designed for earlier times.

3. Trends in New and Emerging Digital Technologies

Since 2002, the New Media Consortium has produced an annual Horizon Report (NMC) that is compelling reading for leaders and educators. Each report identifies "six emerging technologies or practices that are likely to enter mainstream use in the educational community within three adoption horizons over the next one to five years" [1].

In relating these to various educational contexts, schools can determine the extent to which these are understood and being strategically addressed. In addition, past and current practices can be investigated to determine the extent to which these are limiting broader uptake of new technologies, such as blended learning approaches being designed and implemented, digital media being used for formative assessment, and whether or not cloud computing, and mobile learning are being incorporated.

The following section presents conceptualisations [11,12] of evolutionary stages of schooling, and this provides a framework against which schooling might be reshaped in a digital, networked world. Importantly, in considering evolutionary stages, the preceding discussion does not superficially discuss only the digital technologies, but the educational potential of what needs to be valued and integrated into the culture of schools, new models of education, the blending of formal and informal learning, personalised learning, and use of technologies for assessment.

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4. Rethinking the Balance—Networked School Communities and TPACK Capabilities

The shortcoming of the current definition of schooling as being restricted to a physical place called school is reflected in the tensions and contradictions evident between formal and informal learning. Formal learning tends to be characterised by the "command and control" metaphor whereby the education professionals within schools focus on an academic education and status is assigned to the timetabled, formal learning and teaching. This is explicit and well understood by teachers and students with responsibility largely assigned to the school and the teachers. In contrast, informal learning is more implicit and often not assigned status as valued learning. Informal learning allows for including anytime, anywhere learning available 24/7/365 by the students, parents/caregivers and community beyond the traditional school physical place and timetabled lessons.

This was recognised by the Illinois Institute of Technology/Institute of Design [20] and highlights the disjuncture between in school and out of school lives resulting in the lack of real-world relevance of learning in formal schooling.

> *Kids lead high-tech lives outside school and decidedly low-tech lives inside school. This new "digital divide" is making the activities inside school appear to have less real-world relevance to kids. A blend of intellectual discipline with real-world context can make learning more relevant, and online technology can bridge the gap between the two.*

In a similar manner, almost a century ago, John Dewey also advised curriculum designers to attend to the balance between the informal and formal, and noted that:

> *there is the standing danger that the material of formal instruction will be merely the subject matter of schools, isolated from the subject matter of life experience... This danger is never greater than at the present time, on account of the rapid growth in the last few centuries of knowledge and the technical mode of skills.*

It is an opportune time for nations to revisit what they want from their schooling systems. What might nations, that have large annual education budgets, expect of their schools in a networked world? To retain the status quo is insufficient in a global, networked world in which countries need to be internationally competitive driven by innovation.

Central to both the strength of the home-school nexus and the structural changes will be the underlying principle of focusing on *quality teaching*, as well as *quality teachers*. Networked school communities understand and foreground *quality teaching* and the roles played by many in enhancing student learning, and is inclusive of the sites for learning—in addition to the formal "place called school". Teaching has been largely informed by understandings of Shulman's pedagogical content knowledge (PCK), described by Shulman [22] as "the special amalgam of content and pedagogy that is uniquely the province of teachers, their own special form of professional understanding". PCK highlights the importance of teachers' deep knowledge of the curriculum, and the pedagogical knowledge needed to teach this disciplinary knowledge successfully.

However, for teachers to have the readiness to effectively design and engage in networked school communities, we believe that PCK is insufficient without the technological knowledge needed to complement the content knowledge and pedagogical knowledge. Koehler and Mishra [23] have made a substantial contribution by conceptualising *Technological Pedagogical Content Knowledge* (TPCK)—now referred to as TPACK with the connotation of TPACK being the *total package* as a way of representing what teachers need to know about technology, content, and pedagogy. The expanding TPACK research and literature is now informing the development of TPACK capabilities and illuminating what TPACK looks like in practice.

According to Mishra and Koehler [24], teachers with TPACK capabilities not only have content knowledge, pedagogical knowledge, and technological knowledge, but they also have the capabilities to understand the complex interactions between these knowledge components and can make sense of these in terms of their educational contexts. Their advice is consistent with the role of teachers as co-learners and collaborative resource designers, outlined by Twining [12], and referred to earlier in this paper, whereby teachers who have this type of understanding are characterised by the creative, flexible, and adaptive ways in which they navigate the constraints, affordances, and interactions within the TPACK framework.

5. Conclusions

This paper established that we are immersed in an increasingly digital, networked world and that this has implications for reshaping schooling, how we define "a place called school", and, in particular, where and when learning takes place. Through the provision of the conceptualisations of evolutionary stages of schooling [**11**,**12**], the paper suggested that educators can reflect and consider how their educational contexts might be explained in terms of their moves toward digital normalisation and the extent to which they have become networked school communities. Education and technological changes were explicitly foregrounded as being a "wicked" problem, not able to be explained in simple, logical and ordered ways, and educational contexts are complex.

This is an exciting time to play a leadership role in developing a networked school community [**3**] to enhance learning and teaching. Guidance was summarised and discussed in terms of the importance of TPACK capabilities and networked school communities, and the need for expanding the academic focus, expanding the educational perspectives, addressing the bureaucratic and hierarchical imbalances, understanding the complexity of schooling and overcoming simplistic solutions, and capitalising on the largely untapped resources beyond a place called school. Schooling in the 21st Century will require explicit attention to the impact and potential of digital technologies in relation to the broader purposes and models of schooling. Specifically, in advancing thinking about this, this paper has provided guidance in relation to key questions facing leadership to reshape schooling in a networked world, including how might schools move into the networked mode, what is required to lead and manage a networked school community, and how a networked school will become defined less by its physical space and timetabled lessons, and defined more by being networked and understanding that learning can take place anywhere, anytime.

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