Curriculum for Digital Education Leadership:

A CONCEPT PAPER

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COMMONWEALTH *of* LEARNING

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Introduction

The Commonwealth Digital Education Leadership Training in Action (C-DELTA) project is a programme of the Commonwealth of Learning (COL) that intends to promote digital education in the Commonwealth nations. C-DELTA will engage with governments, educational institutions, teachers and civil society organisations to develop learning materials around digital education, assess digital education competencies and provide training opportunities for students, educators and policy makers. The C-DELTA programme will provide a framework for fostering digital education and developing skilled citizens for lifelong learning (Commonwealth of Learning, 2016).

To this end, COL commissioned a research team based at the Centre for Innovation in Teaching and Learning (CILT), University of Cape Town, to develop a concept paper with the aim of theorising a curriculum framework for digital education leadership. In April 2016, the research team (hereafter called CILT)

convened a group of international experts at a two-day workshop in Cape Town, South Africa, to discuss and conceptualise a framework for the curriculum. The Advisory Group (AG) participants at the workshop came from different countries: Canada, Ireland, Malaysia, Mauritius, Pakistan, South Africa and the United Kingdom. In addition, virtual input was received from experts in Australia, Sri Lanka and the USA. The experts came from a range of disciplinary backgrounds, including curriculum design, educational research, educational technology, open and distance learning, and literacy studies. At the workshop, a preliminary draft document was the catalyst for intense discussion, which continued online through contributions in a range of formats, resulting in a genuinely collaborative concept paper.

In this concept paper, we propose a holistic approach to conceptualising digital education leadership. Our assumption is that digital education leadership must be grounded in the practice that it seeks to foster (digital literacy practice) and the processes involved in teaching that practice (digital education). In other words, digital education leadership cannot be viewed in isolation, separate from digital literacy or digital education. C-DELTA will develop digital education leaders who demonstrate effective use of information and communication technologies (ICT) in their respective social contexts and who can advocate, influence and foster such capabilities amongst others in their communities of practice.

The paper introduces the C-DELTA CILT AG's view of the challenges faced in terms of digital education leadership in the global context and how these play out in the Commonwealth context. A set of principles are provided to frame our view of the curriculum framework. Having drawn on the extensive literature review provided in Appendix A, we present our conceptions of digital literacy, digital education and digital education leadership. We

then outline the motivation for the conceptualisation of the proposed curriculum framework for digital education leadership. A more detailed view of the framework, including the relationships between concepts, content and capabilities, is then provided in an expanded form in Appendix B.

Acknowledging Context(s)

It may be useful to situate this proposal for a curriculum for digital education leadership in the context of the C-DELTA CILT AG's understanding of curriculum, digital education and leadership. How this curriculum framework differs from, overlaps with and contests other digital education curricula, frameworks, taxonomies and typologies can, to a large extent, be attributed to a shared understanding of the global context for thinking about such a curriculum, as well as to the specifics of our situatedness as part of the Commonwealth (following Harding, 2004). It is necessary to acknowledge the collective and individual identities that are held as part of the Commonwealth, mostly a collection of former territories of the British Empire, all of which share separate histories as ex-colonies, each of which experienced colonisation in specific ways that have shaped (and in many ways continue to shape) our individual, separate and/or collective identities.

In formulating this proposal for a curriculum for digital education leadership, we therefore acknowledge that our views of digital education and curricula are entangled with and informed by different theoretical traditions as well as histories of different geographical and cultural locations. However, we share a common understanding of the situation that can be succinctly articulated as follows:

a)   We believe it is important to acknowledge that digital education is "a knot of social, political, economic and cultural agendas that is riddled with complications, contradictions and conflicts" (Selwyn, 2014, p. 6). Current accounts of ICT in education are almost uncritically positive, positivist and homogenising (Selwyn, 2014). There is a tendency to look for technical solutions to educational "problems." This has been referred to as "techno-solutionism" (Morozov, 2011), where digital education, for example, aims to solve all social ills and is sold (often literally) as a

"genuinely democratic rearrangement of education opportunity" (Daniel, 2009, p. 2).

b)   We believe that the C-DELTA framework needs to encourage the participation of people from a wide and diverse range of digital experiences. The digital revolution has been unequal and the divides persist (Piketty, 2014). However, we have a shared sense of urgency that though not everyone is currently benefiting from (or included in) the digital era, everyone is affected (Castells, 2009).

c)   Digital education is not a neutral change agenda but an agenda rooted in social, political and economic forces (Castells, 2009; Pasquale, 2015). The technologies we use in educational settings and the ways we organise educational settings around those technologies frame the realities of learners, teachers and educators in all roles.

We acknowledge that our identities and contexts as members of the Commonwealth have shaped this proposal; as such, our proposal for a curriculum for digital education leadership overlaps with but also differs from many of the other digital literacy and digital education frameworks formulated upon assumptions mainly held in the global North. This framework points to a number of broad principles and guidelines without assuming that everyone who uses this framework departs from the same place or, for that matter, ends up at the same address.

A critical digital education goes beyond (i) understanding the potential of and need for being digitally literate and (ii) introducing a set of tools and knowledge; it also empowers teachers and learners to situate themselves in the different (often contesting) discourses and practices of a digitally networked society. It empowers teachers and learners to disrupt taken-for-granted claims and assumptions, and to formulate alternative narratives and strategies based on their own experiences and arising from their own contexts.

Key Assumptions

This framework is founded on key assumptions underpinning a curriculum for digital education and digital education leadership.

The first assumption is that the boundaries between online and offline are disappearing. Though the dividends of the digital revolution are not equally distributed and shared (World Bank, 2016), the boundaries between online and offline are becoming increasingly porous. Considering that vast portions of humanity are still considered to be "offline," the fact that they are documented, measured, tracked, discussed and included/excluded by those who are connected and online illustrates that "living off the grid" is virtually (literally) becoming impossible.

Thus, whilst not everyone is connected or included in digital networks, everyone is affected. "The network society diffuses selectively throughout the planet, working on the pre-existing sites, cultures, organisations, and institutions that still make up most of the material environment of people's lives" (Castells, 2009, p. 25). Teachers and learners need to understand how networks are created and function and have the capabilities to use them "not just to communicate, but also to gain position, to outcommunicate" (Mulgan, 1991, p. 21).

The second assumption is an understanding of digital education as embedded in, perpetuating and/or contesting past, present and future power relations. Digital education leaders need to understand the digital system from the inside out as well as the outside in. They need to understand how human beings are positioned in designed systems, and who can design systems that make different kinds of human action possible. This is because no education and no curriculum is neutral (Apple, 2004) and "[w]hoever holds power . . . decides what is valuable" (Castells, 2009, p. 28).

Guiding Principles

The framework for digital education and leadership is also premised on the principles that the framework should:

♦ be accessible to and applicable to all actors in all education sectors in all countries of the Commonwealth;

♦ acknowledge and — where practicable — raise awareness of and improve the capacity to address inequalities in digital access and education;

♦ support human thriving in situations where the boundaries of human and machine are becoming blurred;

♦ enable agency and leadership to arise at all levels and in all roles and contexts;

♦ maintain a critical perspective on global developments in digital technology and in education; and

♦ provide a holistic view of digital education leadership.

1   A Holistic View of Digital Education Leadership

Given the importance of a holistic approach to digital education leadership, the C-DELTA CILT AG posits the need for digital education leadership to be viewed in relation to digital literacy and digital education. We explain this after providing a rationale for the concept of digital education leadership.

1.1   A Rationale for the Term "Digital Education Leadership"

As societies shift towards the age of digitalisation, digital education is emerging as a growing concern for students, educators and policy makers. Although there has been large-scale integration of technology into learning and teaching activities at schools and universities, by and large the outcomes have not been particularly effective (Phillips, 2015; Price & Kirkwood, 2014). This could be attributed to perceptions about technology shaping social practices (e.g., learning, teaching, etc.) (Oliver, 2011), rather than social practices determining the technological tools to be drawn into a practice (which is purposeful and goal-oriented). The technological deterministic approach leads to the focus being placed on mastering digital competencies. The social practice approach adopted here acknowledges the existence of multiple digital literacies that are context based. Hence, we propose digital education, which is about increasing people's capacity in digital literacies (i.e., context-based digital literacy practices), rather than a digital competencies approach (because there is no one-size-fits-all method). This therefore indicates a need for digital education leaders who can lead others and foster digital literacies relevant to individual and local contexts by: creating awareness of and enhancing access to available resources (and ensuring equal access for the respective stakeholders); developing capacity in individuals, curricula and organisations; making informed, context-appropriate decisions; and cultivating innovation or being change agents in their own contexts.

With the growing importance of digital literacy in educational agendas worldwide, there have been increasing calls for leadership development in digital education (Jameson, 2013; McLeod, 2015; Mishra, Henriksen, Boltz, & Richardson, 2016; Sheninger, 2014). As these calls for leadership development in digital education increase, various terms for describing leadership in this field have also emerged. The terms range from e-leadership, EdTech leadership, ICT leadership, technology leadership, virtual leadership and digital leadership to online leadership (Jameson, 2013). Amongst these terms, "e-leadership" is particularly prevalent. Providing one of the earliest definitions, Avolio, Sosik, Kahai and Baker (2000) define e-leadership as "a social influence process mediated by AIT [advanced information technology] to produce

a change in attitudes, feelings, thinking, behavior, and/or performances with individuals, groups, and/or organizations" (p. 617). The term originates from the field of business and management, although the concept now focuses on leadership in the effective implementation of educational technologies (Jameson, 2013).

For the C-DELTA project, the term "digital education leadership" has been selected for three main reasons. Firstly, it better corresponds with the literacy at stake — digital literacy. Had the literacy been termed "e-literacy" then arguably "e-leadership" would have been a better term. Secondly, as "e-leadership" is more commonly used in business and management to describe virtual leadership, a term that has less historical baggage is preferential. Lastly, "e-leadership" is primarily concerned with the successful implementation of technology in teaching and learning practices. It emphasises leadership in educational technology. Our concern goes beyond this to the fostering of leaders who have the qualities to lead in a digital culture. They must have not only the means to provide knowledge in the effective use of educational technology but also the capacity to foster a culture of collaboration, innovation and lifelong learning in evolving, digitally mediated societies. Furthermore, they need to have insight into the needs of organisations and individuals in a digital (education) landscape. The leaders might not be the most proficient users of digital tools, but they can see how digital tools, networks and associated structural changes impact on their organisation and the work people do and can thereby make appropriate critical decisions. To mark this shift in focus, the preferred term is "digital education leadership."

1.2 Conceptualising Digital Literacy

The foundational dimensions of the digital in this framework are premised on understandings of literacy as social practices. A detailed review of literacy and key literacy concepts related to digital technology that has informed our understanding of digital literacy is provided as Appendix A. In brief, we understand literacy to involve sets of practices which are tied to domains of practice (e.g., learning). To signify that there is no one universal approach to literacy, but that literacy is purposeful, meaningful and bound to domains of practice, theorists who adopt this view tend to use the term in the plural form — literacies (Street, 1984, 2001). Furthermore, because literacy is about being

able to participate in social practices, and because the contemporary world is technology saturated, then in order to create a life for oneself, one needs to be capable of participating (living, learning and working) in this evolving digitally mediated society. Therefore, adopting a social practices approach to viewing literacy has particular implications for the understanding of digital literacy. Succinctly:

a. This approach assumes that digital literacy involves not a set of universal abilities (skills) but aptness in social practices grounded in the digital domain.

b. Practices associated with digital literacy are not "fixed," nor do they occur in isolation; rather, they evolve in relation to the social, cultural, economic and political changes of a given context.

c. It follows then that digital literacy is not a neutral concept but instead ideologically charged, subject to the relations of power and politics.

Informed by the literature outlined in Appendix A, the C-DELTA CILT AG defines digital literacy as people's ability to live, learn and work in an evolving digitally mediated society by mobilising resources, developing digital identities and critically engaging in networks. This definition demonstrates an understanding that digital literacy relates to how people are negotiating pathways within their respective contexts.

The C-DELTA CILT AG's approach to teaching digital literacy is grounded in Green's (1988) "dimensions of literacy." Goodfellow (2004) as well as Lankshear and Knobel (1998) are some of the scholars who have adapted the concept of literacy to apply to new technologies. Adopting a holistic approach, Green (1988) views literacy as comprising three dimensions: operational, cultural and critical. The dimensions are taken to be interrelated and not progressive. As such, it is possible for a person to develop all three dimensions simultaneously, or to be better at one dimension than another at a given time.

The operational dimension is the aspect of literacy concerned with developing performance with "the linguistic systems, procedures, tools and techniques involved in making or interpreting texts" (Goodfellow, 2004, p. 381). In the context of the C-DELTA CILT AG discussions, this dimension was framed as "developing capabilities" needed to operationalise a multimodal

text. This links to views that technologies are a combination of hard and soft dimensions (Daniel, 1999; Dron, Reiners, & Gregory, 2011). Hard technologies are bits and bytes, electrons and email, satellites and search engines. Soft technologies are processes, approaches, sets of rules and models of organisation. As Daniel (1999, p. 69) observes, the hard technologies change, and the challenge that is both intellectually powerful and competitively cost-effective is to get the soft technologies right.

The cultural dimension is the meaning aspect of literacy. This dimension

> takes more emphatic account of the notion that literacy acts and events are not only *context* specific but also entails a specific *content*. It is never simply a case of being literate in and of itself but of being literate with regard to something, some aspect of knowledge and experience. (Green, 1988, p. 162)

In other words, it places "operational competencies to service in an authentic social or occupational context, enhancing the learner's ability to participate in the discourses of the social world" (Goodfellow, 2004, p. 381). Thus, in the context of the C-DELTA CILT AG discussions, this dimension is framed as "in context," that is, producing, consuming and creating within a given cultural context. Moreover, because of the contested nature of the words "discourses" and "cultural" within the curriculum framework, we have chosen to replace the word "cultural" with "situated."

The critical dimension is concerned with developing a critical stance in a given literacy practice. Understanding that literacy practices are ideologically charged relative to those in social, economic and political power, Green (1988) posits that individuals will merely be socialised into the dominant meaning system unless they are provided with "critical insight into the process and possibilities of knowledge production, their own and that of the culture" (p. 163). In this respect, the critical dimension aims to provide "individuals, at any level of schooling, with the means to reflect critically on what is being learned and taught in classrooms and to take an active role in the production of knowledge and meaning" (p. 163). The critical dimension thus entails "the means for transformation and active re-production of existing literacy practices or discourses, developing the ability to evaluate, critique and redesign the resources through which these practices and discourses are mediated" (Goodfellow, 2004, p. 381). In the context of the C-DELTA CILT AG

discussions, this dimension is framed as "beyond context" — that is, analysing and creating beyond context. This dimension is central to explicating the "critical" aspect in digital education. In the C-DELTA CILT AG's view, a critical education is one which promotes questions such as: Why does a particular technology exist? Whose interests does it serve? Whose interests does it frustrate? Could it be used differently and better?

1.3   Conceptualising Digital Education

Drawing on the C-DELTA CILT AG's definition of digital literacy, digital education can then be described as the process of teaching and learning involved in fostering the capabilities that are needed for an individual to live, learn and work in a digital society. In other words, it is concerned with fostering individuals' capabilities to participate in the social practices that are required to live and thrive in the digital age.

The following tenets are deemed central to grounding the understanding of digital education.

a. Digital education is concerned with developing people's capabilities to live, learn and work in a digitally mediated society.

b. Digital education is about more than working with digital resources (technical repertoire); it includes developing new resources and practices (innovation) and the capability and agency to judge and critique the systems of technology production, reproduction and use, as well as the social structures on which they are built (change agent).

c. As technology has a tendency to impact on social practices, with the ability to modify relationships to ourselves, to others and to the world, digital education incorporates a critical understanding of digital culture and practices.

1.4 Conceptualising Digital Education Leadership

It is essential to understand that leadership in digital education is a complex process involving different players at different levels. For instance, researchers are needed to investigate the social practices of digital culture and probe the possibilities and limitations of various educational technologies to inform best practice. Actions and advice from their research also have the potential to inform decision making regarding the choice of technologies suitable for various contextual needs, and to inform the designers of new technologies. Policy makers and heads of organisations are needed to envisage, lead by example and nurture digital literacies in their respective organisations. Teachers are key players in operationalising a given curriculum and integrating educational technologies into their classrooms and beyond. Students can also be digital change agents or leaders through peer-to-peer learning.

This view of leadership in many ways corresponds to Mishra et al.'s (2016) proposition that educational institutions are "complex ecologies." They argue that "[b]y conceptualizing ICT as one element of this complex ecology, we prevent ourselves from falling into the trap of technological determinism, i.e., simple cause and effect relations between the diction of a new technology and its effects on organizations" (p. 261).

There are three key emphases for digital education leadership: (i) the effective implementation of digital technology; (ii) critical reflection on technologies; and (iii) leadership in fostering a particular type of individual for the digital age. This is evident in our definition of a digital education leader, which draws on the concept of an epistemic fluency that allows one to recognise, appreciate and understand the subtlety and complexity of a belief system one has not encountered before, whether that belief system is associated with a religious or ethnic community, or a scientific or professional community. This is important for an inter-cultural and inter-disciplinary understanding and capability (Goodyear & Zenios, 2007). Digital education leaders need to be able to take account of the context for action, and the ways in which — intentionally and unintentionally, for good or for less good — the introduction of new technologies inherently influences the context.

All in all, the C-DELTA CILT AG adopts a holistic view of digital education leadership, understanding that leadership in digital education occurs not in isolation, but as a means of nurturing and leading digital education and digital literacies. Drawing on the above descriptions of digital literacy(ies), digital education and digital education leadership, and the C-DELTA CILT AG's argument that literacy is concerned with participating in social life, digital literacy is placed at the centre for living, learning and working in an evolving digital society. This is aligned with the view that digital literacy is not an ability but a practice.

Figure 1 provides a visual summary of the C-DELTA CILT AG's perspective on the relationship between digital literacy, digital education and digital education leadership.

Digital literacy, as a social practice, is understood to be the core, as it is the outcome, the destination of digital education and digital education leadership. It is the purpose of digital education.

Digital education is the pedagogic intervention that goes into fostering digital literacies. It is the "how" of getting to digital literacy.

Digital education leadership is concerned with providing direction in terms of digital education by enhancing access, capacitating peers, making informed decisions and cultivating innovation, to achieve the learning goal (digital literacy).
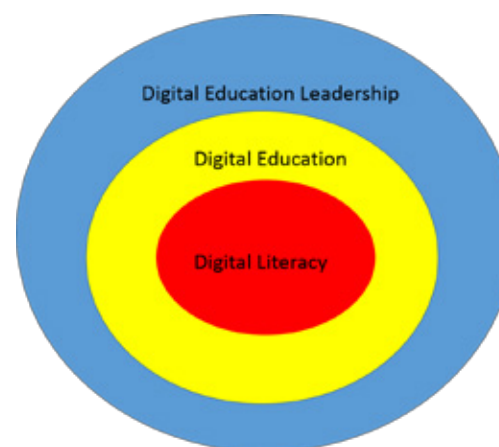

FIGURE 1. A HOLISTIC VIEW OF DIGITAL EDUCATION LEADERSHIP.

2   Conceptualising the Curriculum

Numerous curriculum and competency frameworks already exist in the area of digital literacy/skills, ICT eLearning competency and digital leadership/management, including ones generated by members of the AG. For example, one member co-produced a comprehensive review of frameworks for describing and developing digital capabilities[1] (McGill & Beetham, 2015), and another contributed to the General Technology Competency and Use (GTCU) Profile Tool developed in Canada.[2] Therefore, the first consideration was to consider why a new framework needed to be developed for COL and why an existing one could not be adapted. It was agreed that some of the limitations of existing frameworks included:

a.   a limited focus on only one aspect of digital educational leadership;

b.   a limited contextual focus (i.e., geared towards secondary education or higher education only);

c.   a lack of alignment with curriculum content; and

d.   a predominant focus on skills and competencies rather than a view of digital education leadership as being situated in social practice.

The most important limitation was agreed to be that existing frameworks have been developed in very specific country contexts — almost always (although not exclusively) in the global North. As highlighted in the introduction, the global South faces very real issues of varied access not only to digital resources but also to knowledge, resulting in different levels of inclusion and exclusion. Consequently, a new curriculum would need to be adaptive enough to provide ways for people to understand but not be overwhelmed by the global context, and in particular come to realise and value how they, through their local contexts and networks, can engage with and make valuable contributions to the digital world.

2.1   Rationale and Purpose

As explained in the introduction, C-DELTA aims to promote the digital education environment in Commonwealth nations. The intention is to engage with governments, educational institutions, teachers and civil society organisations to develop learning materials around digital education skills, assess digital education competencies, provide training opportunities for teachers and monitor student achievement in relation to relevance for livelihood

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1   See https://digitalcapability.jiscinvolve.org/wp/2015/11/10/framing-digital-capabilities-for-staff-deliverables/.
2   See http://eilab.ca/gtcuprofiles/.

opportunities. COL has articulated that the C-DELTA programme will provide a framework for fostering digital learning and will develop leaders who demonstrate the effective use of ICT as well as advocating, influencing and building capacities amongst others (Commonwealth of Learning, 2016).

The C-DELTA CILT AG supports these objectives in developing a conceptual framework to delineate the contours of what comprises digital education leadership. As explained in the previous section, the framework conceptualises digital education leaders as concerned with fostering digital literacy, innovation and change, as people who influence others through their creative pursuits and innovations in the effective use of ICT for teaching and learning. This view goes beyond skills and competencies, although digital education leaders need to be fluent in the use of ICT for learning and teaching. As a digital education leader, the individual must be able to translate literacy to leadership through questioning the status quo, providing direction and exercising influence.

The curriculum is therefore located in the sociocultural practices of participants' diverse contexts. The curriculum acknowledges histories, bodies of knowledge and thought leaders from a range of COL countries and is designed to be sensitive to participants' contexts and experiences.

2.2   The Learners

Governments, educational institutions and civil society organisations across Commonwealth countries and beyond may use the framework, curriculum, courses and assessment tool being developed in this project.

It is assumed that leadership is an attribute of an individual and is related to any position or roles they may have. Digital education leadership, from this perspective, will involve different players at different levels. This initiative envisages three sets of learners: students, teachers and policy makers. Whilst the curriculum may be the same for some of the components for the groups, their depth and the way participants engage with the curriculum are likely to differ.

An example of how this might work in practice can be seen in the Alberta Government's "quick guide" to their learning and technology policy framework. Here, they outline the roles of different constituencies (e.g., students, teachers and government) in implementing the framework (Alberta Government, 2013). This is a helpful type of resource that could be usefully developed alongside the curriculum in Phase 2 of the present project so that governments, educational institutions and organisations who might use the framework could be guided in its implementation.

2.3   Conceptual Framework for Digital Education Leadership

A curriculum for digital education leadership requires two components: digital education and leadership in digital education, with digital literacies as the basis for both. The two components for the curriculum framework have been developed on the assumption that before an individual becomes a digital education leader, that individual must first demonstrate capability in the practices identified with digital education. In other words, the assumption is that a leader should be able to walk their talk and can only lead if they have the necessary knowledge in the "stuff" to be led. Hence, two linked frameworks have been developed: one addressing digital education and one addressing leadership in digital education.

As explained in detail in the previous section, the C-DELTA CILT AG defines digital education as the process of fostering people's ability to live, learn and work in an evolving digitally mediated society by (i) mobilising resources, (ii) developing digital identities and (iii) engaging with networks.

Mobilising resources refers to the processes of finding out which resources are available to participants in their contexts, which skills are needed in order to acquire the necessary capabilities to draw on these resources, the development of understanding of how these resources are used in practice in particular contexts, and the development of capabilities to evaluate, combine and create new resources. The assumption is that resources extend beyond technology alone and also encompass tangible resources (such as people). For example, in order to learn about a particular use of educational technology, lecturers can turn to educational technologists or academic developers within their institutions for help. The educational technologists and academic

developers in this way become "resources" that lecturers mobilise to assist them in their endeavours.

Developing digital identities refers to working with the digital tools and networks to which people have access in their contexts in order to enable them to create and manage their own online presences and footprints, and to exercise control over their expression of this digital identity (or identities). By implication, this involves negotiating pathways within contexts.

Engaging with networks refers to interacting with networks in a manner that is meaningful and purposeful. This entails constructively sharing information, knowledge and resources. In the online space, this can entail building on people's understanding of the social media ecosystem to enable choices regarding where and how they can create online profiles, interact with people across different networks and build personal learning networks. This also includes an understanding of who is included or excluded from networks and how, as well as leader roles that transform the status quo.

As mentioned earlier, to understand digital literacy the C-DELTA CILT AG adopts the view of literacy as social practice. This approach to literacy has assumed that taking part in literacy practices involves three dimensions of engagement: operational, situated and critical. We found these dimensions useful but, given the diversity of contexts, added a fourth — access.

The operational dimension involves being able to make meaning using diverse media and modes of communication. This requires the ability to code and decode print, understand the affordances of a range of modes, operate technologies and know where and how to access information. This dimension is what is often thought of as skills and competencies (especially regarding computer literacy and information literacy), but it also refers to the basic issues of access and the availability of resources, such the Internet and machines.

The situated dimension involves being able to understand, interpret and produce the cultural signs that are part of meaning making in specific situated social contexts, discourse communities and "affinity groups" (Gee, 2005).

The critical dimension entails being able to engage critically in meaning making, understand how texts position and represent people, interrogate issues around agency and power, and understand issues of voice and the conditions for its production and uptake.

The access dimension is added as a fourth dimension in this curriculum framework. As indicated in the introduction, it is particularly important. Commonwealth countries are not a homogenous entity. Access is varied, not only to digital resources but also to knowledge. This results in different levels of inclusion and exclusion. In addition, given our view of digital education leadership as situated in social practice, it is critical to start with the context in which the participant is located so they can draw from what they have and not be excluded by what they do not have.

We therefore envision the following curriculum framework for digital education:

	LITERACY			
Activities Set	Access	Operational	Situated	Critical
Mobilising resources				
Developing digital identities				
Engaging with networks				

DIGITAL EDUCATION

Digital education is defined as the process of fostering people's ability to live, learn and work in an evolving digitally mediated society by (i) mobilising resources, (ii) developing digital identities and (iii) engaging with networks. This means working with individuals, institutions, communities and networks to foster people's ability to live, learn and work in an evolving digitally mediated society by:

a. enhancing access — i.e., environmental considerations;

b. developing capacity in individuals, curricula and organisations — i.e., operational dimensions;

c. making informed decisions appropriate to context — i.e., situatedness, being a leader and change agent within a given context; and

d. cultivating innovation — i.e. situatedness, being a leader and change agent outside a given context.

Digital education leadership is therefore summarised below.

* enhancing access
* making informed decisions appropriate to context
* developing capacity in individuals, curricula & organisations
* cultivating innovation

in
* mobilising resources
* developing digital identities
* critically engaging with networks
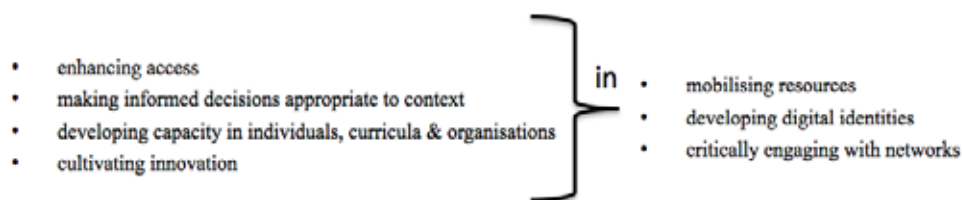
In light of this representation of digital education, we conceive of the following curriculum framework for fostering digital education leadership:

LEADERSHIP				
Activities Set	Enhancing Access	Developing Capacity	Making Informed Decisions	Cultivating Innovation
Mobilising resources				
Developing digital identities				
Critically engaging with networks				

Digital education leadership is more than a set of digital abilities or skills; it is a method and set of processes for doing and thinking about digital education. Hence, in order to construct a curriculum for digital education leadership, it is necessary for people to have the required capabilities to build on so that they can lead others in this regard.

This process is therefore not lateral, nor is it neatly linear, simply starting at the bottom and working to the top, especially given that many individuals (such as students) have proven themselves to be digital leaders in some regard. The question then arises as to how participants can be assisted to ascertain their starting point in terms of digital education leadership and how they can best determine which aspects of the curriculum are relevant for them. The intention is to use an approach whereby participants reflect upon and document what type of digital leader they are and then assess the development of their capabilities throughout the modules (such as those of the Oxford Brookes Open Online Course[3]). This enables an individual to construct a personal learning path through the curriculum. Such an approach can also be replicated at an organisational level so the curriculum is contextualised and customised for a group process.

2.3.1 CURRICULUM OUTCOMES

To map the framework to capabilities, we will use the following approach for articulating a curriculum framework:

Big Ideas: Declarative statements describing concepts that transcend grade levels. Big Ideas are essential to provide a focus on specific content for all students.

Concepts: Describe what students should know (key knowledge) as a result of this instruction, specific to grade level.

Competencies: Describe what students should be able to do (key skills) as a result of this instruction, specific to grade level.

Essential Questions: The questions are connected to the Standards Aligned System (SAS) framework and are specifically linked to the Big Ideas. They should frame student inquiry, promote critical thinking and assist in learning

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3　See http://www.moodle.openbrookes.net/login/index.php.

transfer. This approach has been used successfully elsewhere — for example, in the SAS of the Pennsylvania Department of Education[4] and in British Columbia's curriculum framework. It is of interest that in the latter framework, three elements — Content (Know), Curricular Competencies (Do) and Big Ideas (Understand) — all work together to support deeper learning.[5]

Content is considered the "Know," containing details of the essential topics and knowledge at each level. The Curricular Competencies are the skills, strategies and processes that students develop over time; they reflect the "Do" in this model of learning. The Big Ideas consist of generalisations and principles as well as the key concepts important in an area of learning; they reflect the "Understand" component of the model.

These approaches and categories have been utilised in the examples provided in Appendix B, showing the detail of the proposed curriculum and capability framework. In this example, each "row" in the matrix is viewed as a module. Each module has a "big idea" and essential questions which outline the important "concepts" in the module. The dimensions are then unpacked in terms of the "concepts," "content" and "capabilities." Finally, the key concepts guide and align with the learning content, and the capabilities enable the development of appropriate assessment.

2.3.2 TOOLS AND FRAMEWORKS TO DEVELOP LEARNERS' CAPABILITIES

Following JISC's approach (McGill & Beetham, 2015) approach, the term "capabilities" is used here rather than the term "competencies" in order to demonstrate the view that digital literacy is not an end in itself or a skill to be mastered by everyone in the same way. This aligns with the overall multi-literacies view that people can have a range of digital literacies in different digital literacy dimensions.

An individual is not necessarily neatly located in one column for all practices. They might lack the operational skills to mobilise resources but have a strong situated practice in the area of digital identities. It would therefore not be possible to create a linear and step-by-step curriculum. Rather, a flexible

curriculum is provided whereby individuals are able to select their own individually tailored pathways according to their own needs.

C-DELTA envisages digital education leaders at three levels. Given the natural development of fluency across the dimensions, we see them as directly related. They are summarised here.

Level 0	Access	Awareness of and Access to Resources, Networks, etc.
Level 1: Digital Education Enthusiasts (Literacy)	Operational	Develop capabilities
Level 2: Digital Education Champions (Intermediate)	Situated	Create and act within context
Level 3: Digital Education Experts (Fluent)	Critical	Create and act beyond immediate context

It is clear that assessment needs to be considered at all levels. At the same time, it is necessary to move beyond access and capabilities to practices and beliefs. This trajectory is essential for the digital education leader, as they have to be able to understand the context of digital education, coach others on how to appropriately use ICT for learning, model the practices they propose for others and openly share what they do. The teaching and learning processes which we follow in order to achieve the desired capabilities will determine the assessment for each of these levels.

2.3.3 PROCESSES OF LEARNING

The pathways of learning will be determined and articulated in Phase 2, during the process of engaging in detail with the modules' content and learning activities. In general and given the overarching guiding principles, it would be appropriate to structure these using a problem-based learning or experiential learning approach.

Digital leaders need to be able to draw on resources specific to their own contexts to engage in tasks of real meaning and value for their community's digital culture and practices. At the same time, leaders can contribute to

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4   See https://www.pdesas.org/default.aspx.
5   See https://curriculum.gov.bc.ca/curriculum-info.sc.

building a growing store of open content. An example to be emulated is the "Developing Leaders for a Digital Age" open course developed by Oxford Brookes University,[6] as in addition to creating a collaborative store of open resources, it also engages participants in authentic leadership tasks with peer support. This authentic learning approach, grounded in developing knowledge through real-life problem-solving contexts (Herrington, Reeves, & Oliver, 2010), enables leaders to grow in confidence in terms of their own digital capabilities and practices.

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6   See http://www.moodle.openbrookes.net/course/view.php?id=28.

3   Conclusion

The process of developing this concept document and curriculum framework has generated intense discussions and deliberations, with the framework providing a powerful catalyst. It has become clear that the theoretical and conceptual approach presented in this document will inevitably require further interrogation as the curriculum is taken forward from framework to content. What has been presented is a blueprint — a plan or prototype — that will shape and guide the subsequent design and process of the Digital Education Leadership curriculum and therefore future practice. The conceptual approach and guiding principles which underpin this framework have been thoroughly interrogated by the Project Team, and the Advisory Group has been unusual in its depth of commitment, participation and contribution.

The implementation of this curriculum framework in practice will take place in Phase 2, which builds directly on the ideas and the plans outlined here. It is likely that Phase 2 would adopt an Educational Design Based Research Approach, which is well founded in light of the thorough review of the literature, the research and the consultation with a group of experts in the field undertaken in Phase 1. Design Based Research (DBR) is a process of iterative development, testing and evaluation (Herrington, Reeves, & Oliver, 2010) which is strongly rooted in the authentic learning approach. This approach sits comfortably with the situated social practice view presented in this concept paper and provides a conceptually coherent methodology for the proposed C-DELTA CILT AG framework presented in this document.

Having worked through the first step of DBR and defined the problem in consultation with researchers and practitioners, we believe Phase 2 would work well using the principles and framework of DBR to inform and guide the creation of the C-DELTA curriculum — the processes of content, learning and teaching. These would then be examined recursively in the light of the overarching principles and framework and would be appropriately revised before pilot implementation.

The approach proposed by the C-DELTA CILT AG arguably provides a sound research-led basis from which to continue and opens up a space for exciting possibilities going forward.

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5   Appendix A: Literature Review

5.1   The Concept of Literacy

Literacy is a fiercely contested concept — or rather, what counts as "literacy" is fiercely contested globally. Dictionaries define literacy as the ability to read and write. Within education, literacy is understood as the ability to read, write and use arithmetic; the emphasis is on proficiency with language and numeracy. In tracing the evolution of the concept, the United Nations Educational, Scientific and Cultural Organization (UNESCO) (2004) observes that up until the mid 1960s, literacy — the ability to read, write and use arithmetic — was generally taken as a set of technical skills which individuals could acquire as part of basic education. This perspective shifted in the 1960s and 1970s, when the concept expanded beyond the instruction of technical skills for educational purposes and became increasingly associated with employment and economic development. UNESCO introduced the term "functional literacy" in 1956 to describe "the process and content of learning to read and write to the preparation for work and vocational training as well as a means for increasing productivity" (cited in Verhoeven, 1994, p. 6). The 1990s saw yet another shift in perspective as views of literacy moved away from a focus on an individual's competence in a set of generic skills and towards a focus on literacy as a social practice. Gee (1999) describes this as the "social turn" in literacy practices. The social turn highlighted "critical literacy" — that is, approaches to literacy that focused on "'problematising' cultures and knowledge of text — putting them up for grabs, for critical debate, for weighing, judging and critique" (Luke, Comber, & Grant, 2003, p. 22).

Despite all these various takes on literacy, from its basic meaning as the ability to read and write to the view of literacy as grounded in social practice, what is less questioned is the relationship between literacy and technology. Up until quite recently, literacy has, for the most part, been associated with print technology. For instance, even as late as 2004, literacy was still being defined as "the ability to identify, understand, interpret, create, communicate, compute and use printed and written materials associated with varying contexts" (UNESCO Education Sector, 2004, p. 13). As digital technology becomes increasingly important in shaping our world, it is bringing yet another defining moment in the evolution of literacy. Mills (2010) uses the term "digital turn" to describe the "increased attention to new literacy practices in digital environments across a variety of social contexts" (p. 246).

Before moving on to explicating our approach to literacy, it is worthwhile to highlight that the term "literacy" has always held a degree of status. This may be attributed to the fact that the concept has tended to be associated with language — alphabetic literacy. Around the 1980s, though, there were increasing attempts to extend the notion of literacy. Subsequently, numerous forms of metaphorical literacy came to be articulated in relation to other modes of communication, such as visual literacy and film literacy. Although this approach to literacy recognised diversity in literacy practices, a disadvantage was that in popular use, the word increasingly came to be a synonym for "skill," "competence" and "proficiency" — for example, "emotional literacy" and "spiritual literacy." The proliferation in the term's use shifted the idea of literacy from a "set of abilities required to do something or associated with a particular sphere of activity" to "any set of abilities" (Martin, 2006, p. 8). The danger of using literacy in this way is that "as uses of the term multiply, the polemical value of such a claim — and its power to convince — is bound to decline" (Buckingham, 2008, p. 75).

5.2 Key Literacy Concepts Related to Digital Technology

Various literacy concepts related to digital technology have emerged since the introduction of computers into education in the 1960s. We identify four key concepts that dominate the literature on literacies related to digital technology: information literacy, media literacy, computer/ICT literacy and digital literacy. Each is often described as an "umbrella concept," encompassing a range of other "smaller" concepts. For instance, visual, television, cine-literacy and multimodal literacy can be grouped under the umbrella concept of media literacy; data literacy can be grouped under information literacy; ICT, network and web literacy can be grouped under digital literacy. To gain perspective on the scale of the usage of the terms over time, we conducted a superficial search of the terms in EBSCOhost by typing specific keywords into the search engine (see Table 1). EBSCOhost was chosen simply because of its large database. The search was superficial in the sense that the numbers were not entirely accurate. A closer examination, for instance, revealed that certain literature grouped under the keyword entered were in fact not concerned with the concept searched. Although not entirely accurate, the numbers nevertheless provide some insights into the use of the terms.

Table 1 reveals that information literacy dominates the literature, with digital literacy second. Literature on digital literacy, however, appears to be growing at a faster rate than literature on information literacy. Literature on media literacy has been growing steadily over the years, whilst publications on computer literacy appear to be decreasing. ICT literacy is a new, emerging term. We see ICT as the trending term emerging from computer literacy, so we group the two concepts together. Figure 1 presents a graphical view of the growth trends for these terms.

TABLE 1: AN OVERVIEW OF THE LITERATURE AS FOUND ON EBSCOHOST

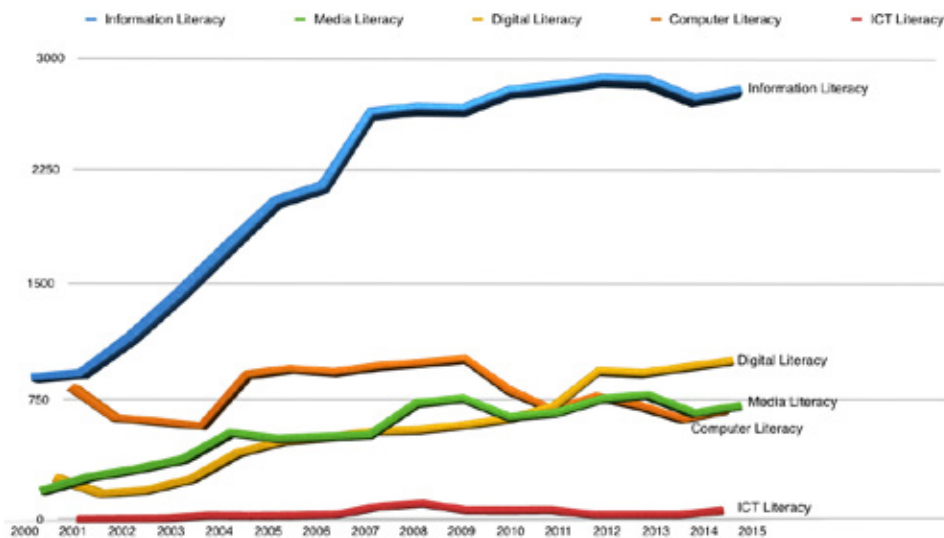| YEAR	INFORMATION LITERACY	MEDIA LITERACY	DIGITAL LITERACY	COMPUTER LITERACY	ICT LITERACY
2015	2,380	637	911	641	54
2014	2,330	596	876	587	28
2013	2,436	696	840	668	28
2012	2,445	675	851	723	28
2011	2,405	597	648	645	57
2010	2,375	574	576	760	55
2009	2,272	678	541	944	56
2008	2,278	651	514	921	96
2007	2,248	476	505	901	78
2006	1,832	465	471	865	30
2005	1,746	455	450	884	24
2004	1,493	486	383	851	22
2003	1,231	341	236	549	24
2002	990	286	171	572	8
2001	796	243	153	596	6
2000	773	167	240	774	4

FIGURE 1. GROWTH TRENDS OF TERMINOLOGIES.

In what follows, we provide a brief overview of the four key literacies outlined: information literacy, media literacy, computer/ICT literacy and digital literacy. The purpose is to identify where the concepts intersect and where they diverge. We argue that the four literacies are not competing concepts — they are different and important in their own unique ways. Outlining the interrelationships and identifying the key characteristics of each literacy will assist us in understanding what each of them means for practice and how to respond to them more effectively.

5.2.1   INFORMATION LITERACY

Information literacy as a term has been established for much longer than the others (Bawden, 2001). It has dominated literature related to technology in education for more than two decades. Information literacy emerged from an older concept, library literacy, which is concerned with competence in the use of libraries, the skill of finding information (Bawden, 2001). Koltay (2011) summarises the nature of information literacy as follows:

> [Information literacy] emphasizes the need for careful retrieval and selection of information available in the workplace, at the school,

and in all aspects of personal decision-making, especially in the areas of citizenship and health. Information literacy education emphasizes critical thinking, meta-cognitive, and procedural knowledge used to locate information in specific domains, fields, and contexts. A prime emphasis is placed on recognizing message quality, authenticity and credibility. (p. 215)

Drawing from this summary, it can be said that information literacy is primarily concerned with the retrieval of information and the ability to assess its quality.

An overview of definitions over time yields insight into how the term has evolved since its first conception. Credited as the first user of the term, Paul G. Zurkowski (1974), in a submission to the U.S. National Commission on Libraries and Information Science in his capacity as president of the U.S. Information Industries Association, described the information literate as those who have been "trained in the application of information resources to their work. They have learned techniques and skills for utilizing the wide range of information tools as well as primary sources in molding information solutions to their problems" (p. 6). Understanding literacy as the ability to read and write, Zurkowski (1974) wrote that "[w]hile the population of the U.S. is nearly 100% literate, only a small portion — perhaps one-sixth, could be characterized as information literates" (p. 7). In this early conception, the emphasis is on a specialised skill needed in the workplace. By the early 2000s, the concept had significantly grown in importance. Not only was it identified as an essential skill in the workplace, but it was recognised as pivotal in all aspects of life. In the Prague Declaration (2003), which emerged from experts on information literacy in the U.S. National Commission on Libraries and Information Science, the National Forum on Information Literacy, and UNESCO, information literacy is described as being "key to the social, cultural, and economic development of nations and communities, institutions and individuals in the 21st century" and a "prerequisite for participating effectively in the Information Society." According to the declaration, information literacy is "part of the basic human right of lifelong learning" (Prague Declaration, 2003). By the late 2000s, besides conceptualising information literacy as a fundamental skill needed to effectively participate in civil society, there was also increasing emphasis on the ability to use information and communication technologies to access and create information. In a policy brief, the UNESCO Institute for

Information Technologies in Education (2011) defined information literacy as "the ability to locate, identify, retrieve, process and use digital information optimally" (p. 2). This definition exemplifies the move towards a focus on digital resources. Table 2 illustrates the shift in focus over time.

TABLE 2: SHIFTING FOCUS IN DEFINITIONS OF INFORMATION LITERACY

AUTHOR/ INSTITUTION	DEFINITION	EMPHASIS
Zurkowski (1974)	People trained in applying information resources to their work can be called information literates. They have learned techniques and skills for utilising a wide range of information tools as well as primary sources in moulding information solutions to address their problems.	Workplace skills.
The Prague Declaration (2003)	Information literacy encompasses knowledge of one's information concerns and needs, and the ability to identify, locate, evaluate, organize and effectively create, use and communicate information to address issues or problems at hand; it is a prerequisite for participating effectively in the Information Society and is part of the basic human right of lifelong learning.	Participation in all aspects of life; basic human right.
UNESCO (2011)	The ability to locate, identify, retrieve, process and use digital information optimally.	Digital information.

Various approaches to cultivating information literacy have been proposed over the years. One is the Seven Pillars of Information Skills model developed by the Society of College, National and University Libraries (SCONUL) in the UK in 1999. Criticised for being "too focused on an enumeration of skills and too reflective of the views of librarians and practitioners" (SCONUL, 2015, p. 3), the model underwent a revision in 2011. The seven pillars of the revised model are as follows:

♦ Identify: able to identify a personal need for information.

♦ Scope: can assess current knowledge and identify gaps.

♦ Plan: can construct strategies for locating information and data.

♦ Gather: can locate and access the information and data they need.

♦ Evaluate: can review the research process and compare and evaluate information and data.

♦ Manage: can organise information professionally and ethically.

♦ Present: can apply the knowledge gained — presenting the results of their research, synthesising new and old information and data to create new knowledge, and disseminating the latter in a variety of ways.

Underpinning the revised model is the idea that "developing an information literate person is a continuing, holistic process with often simultaneous activities or processes" (SCONUL, 2011, p. 4). The model is circular in nature rather than linear. The assumption is that rather than following a step-by-step process, a person can be developing competencies associated with several pillars simultaneously and independently. The model takes into account changes in the information world by conceiving progress within each pillar as flexible: "it is possible to move down a pillar as well as progress up it" (SCONUL, 2011, p. 3). In this way, an individual can develop from novice to expert and back to novice again along with changes within the information world. SCONUL (2011) states that "the expectations of levels reached on each pillar may be different in different contexts and for different ages and levels of learner and is [sic] also dependent on [the] experience and information needed" (p. 3). For SCONUL, information literacy is an umbrella concept that shelters numerous other concepts, such as digital, visual and media literacies, academic literacy, information handling, information skills, data curation and data management. To render the model relevant to various concepts or users of a particular community and age, the model is presented as a generic core to which a series of specialist lenses can be applied. In a 2015 brief, SCONUL documented five specialist lenses that have been developed, one of which is digital literacy.

In sum, traditionally rooted in the retrieval of print resources, information literacy has evolved to encompass digital resources. This is essentially where information literacy overlaps with digital literacy.

5.2.2 MEDIA LITERACY

Though the concept of media education has been around since the 1930s, it was not until the 1970s that, in an attempt to define and justify their work, advocates of media education began to make use of the word "literacy" (Buckingham, 2013). According to the European Commission (2007), media literacy is concerned with "the ability to access the media, to understand and to critically evaluate different aspects of the media and media content and to create communications in a variety of contexts" (cited in Koltay, 2011, p. 213). A media-literate person is described as one who "can decode, evaluate, analyze and produce both print and electronic media" (Aufderheide, 1992, cited in Koltay, 2011, p. 212). Media encompasses a range of communication channels, including television, cinema, video, radio, photography, advertising, newspapers and magazines, recorded music, computers and the Internet (Buckingham, 2013). Buckingham (2013) describes media literacy as a form of critical literacy:

> [Media literacy] involves analysis, evaluation and critical reflection. It entails the acquisition of a "metalanguage" — that is, a means of describing the forms and structures of different modes of communication; and it involves a broader understanding of the social, economic and institutional contexts of communication, and how these affect people's experiences and practices (Luke, 2000). Media literacy certainly includes the ability to use and interpret media; but it also involves a much broader analytical understanding. (p. 38)

As media texts are "multimodal," encompassing an array of communication modes — such as writing, images and sound — media literacy often requires a range of other literacy concepts, including visual, audio, video and multimodal literacy.

Media literacy overlaps with information literacy in that information retrieved from the media to some extent corresponds to and complements library resources. This may explain why in UNESCO's Media and Information Literacy (MIL) Policy and Strategy Guideline (2013), media and information literacy is treated as a "composite concept," a unified whole.

In the Canadian context, media literacy has mostly been applied only to K-12 education and some extra-curricular activities, summer camps and community organisations (Koltay, 2011). In the UK, media literacy came into the agenda in the 1980s as a result of attempts to integrate it into the English curriculum (Buckingham, 2013). In the higher education context, media literacy is generally isolated to discipline-specific areas such as media studies. This suggests that the teaching of media literacy has tended to be confined to specific subjects or disciplines. This scenario, however, may change as leading bodies such as UNESCO come to recognise the significance of media literacy in the current age. UNESCO's (2013) MIL Policy and Strategy Guideline, for instance, emerged from a recognition of the integral role that media and information systems play in "promoting human rights, democracy and equitable development" (p. 8). According to UNESCO (2013):

> Without a MIL policy and strategy, disparities are likely to increase between those who have and those who do not have access to information and media, and enjoy or not freedom of expression. Additional disparities will emerge between those who are able and unable to find, analyse and critically evaluate and apply information and media content for decision-making. (p. 12)

As the digital space increasingly becomes the space for the distribution of media content, we speculate that media literacy will gain greater attention from educational leaders.

Media literacy is arguably the precursor to digital literacy. The media literacy movement of the 1970s–1990s is regarded by scholars as a key antecedent to contemporary digital literacy initiatives (Hoeschmann & Dewaar, 2015). According to Hoeschmann and Dewaar (2015), the media literacy initiatives of that time received much less initial support from provincial ministries of education compared to the digital literacy movement, which received "a policies push from above (the *landscape*) and a pedagogies groundswell from below (the *terrain*)" (p. 4). This suggests that the naming of the literacy is critical in its prioritisation. In *Media Education: Literacy, Learning and Contemporary Culture*, Buckingham (2013) conceives of digital literacy as dealing with literacy issues arising from digital media. He describes digital literacy as the "new

direction" in media education – "media literacy going online" (Buckingham, 2008). Buckingham (2013) emphasises that like media literacy, digital literacy not only requires functional skills, such as the ability to retrieve information and use word processors and search engines, but also requires an ability to evaluate and use information critically. What is more, he posits that "just as print literacy involves writing as well as reading, digital literacy must involve creative production in new media as well as critical consumption" (Buckingham, 2013, p. 177).

5.2.3   COMPUTER/ICT LITERACY

Whereas both information and media literacy emphasise analytical and critical skills, computer/technology/ICT literacy emphasises functional skills. For example, the competencies related to computer/ICT literacy, as listed by Beetham, McGill and Littlejohn (2009), mostly involve practical skills:

♦ keyboard skills

♦ use of capture technologies

♦ use of analysis tools

♦ use of presentation tools

♦ general navigation/user-interface (UI) skills

♦ adaptivity/agility

♦ confidence/exploration

Elsewhere, Rushkoff (2010) talks of "learning to code" as an essential competence of literacy in the digital age. According to Rushkoff (2010):

> as we move into an increasingly digital reality, we must learn not just how to use programs but how to *make* them. In the emerging, highly programmed landscape ahead, you will either create the software or you will be the software. It's really that simple: Program, or be programmed. (p. 7)

Although computer/technology/ICT are keywords often used to indicate functional skills in the use of computer technology, there is a general consensus that computer/ICT literacy goes beyond this and must include critical skills. Already, in the early 2000s, Eisenberg and Johnson (2002) observed that there was "increasing recognition that the end of result of computer literacy is not knowing how to operate computers, but to use technology as a tool for organization, communication, research, and problem solving."

According to Mason and McMorrow (2006), computer literacy consists of two distinct components: awareness and competence. Awareness requires "an individual to have knowledge of how computers affect his/her daily life or society as a whole," and competence requires "an individual to demonstrate a 'hands on' proficiency with software application" (p. 94). Mason and McMorrow (2006) say that it is instructionally difficult to separate the two components, as it is "hard to say where awareness ends and competence begins" (p. 99). They argue that "[a] student who is technically proficient (i.e. competent) but lacks awareness cannot be said to be 'computer literate.' The reverse is also true" (p. 99). This suggests that whilst critical engagement with technology is not the same as constructive use, the two components are undoubtedly connected, reinforcing one another in all practical teaching contexts. Tracing the evolution of computer literacy, Mason and McMorrow (2006) discern a corresponding parallel between attitudes/approaches to computer literacy and advancements in computer technology. They observe that in the 1970s, when minicomputers were the trending technology, definitions of computer literacy tended to focus on awareness. This is largely because whilst the general populace was not expected to have direct interaction with computers, it was deemed important that they be informed about how computers affected their daily lives. By the 1980s, however, with the introduction of personal computers (PCs)/microcomputers in the public sphere, there was a shift from awareness to competence. Computer literacy at this time was conceived of as the ability to use word processors, spreadsheets and presentation graphics and be capable of rudimentary file management. The rise of the Web/Internet in the 1990s further pushed definitions of computer literacy towards competence and away from awareness. Arguably, the pragmatic approach to computer literacy peaked at this time. The 2000s, however, saw definitions shifting back towards societal impact (i.e., awareness) with the introduction of mobile/wireless devices. It has been suggested that the reasons for this shift were the blurring of boundaries between work and recreation, and the sense that PC competence was not required for using mobile devices.

Besides a shift in attitude, the introduction of mobile/wireless devices also appears to have introduced a new terminology into the literacy landscape: information and communications technologies (ICT). Computer literacy in this sense can be considered the antecedent to ICT literacy. In 2004, the UNESCO Asia and Pacific Regional Bureau and the Commonwealth of Learning defined ICT as "technologies used to communicate and to create, manage and distribute information. A broad definition . . . includes computers, the Internet, telephones, television, radio and audiovisual equipment" (cited in Pernia, 2008, p. 11). In 2002, the Educational Testing Service defined ICT literacy as the ability to use "digital technology, communication tools, and/ or networks to access, manage, integrate, evaluate, and create information in order to function in a knowledge society" (cited in UNESCO, 2008, p. 12). More recently, the UNESCO Institute for Information Technologies in Education (2011) has defined ICT literacy as "a set of user skills that enable active participation in a society where services and cultural offerings are computer-supported and distributed on the internet" (p. 2). These two definitions represent a shift from envisioning ICT as a broad term/concept encompassing a range of communication tools, moving back to a definition that is more closely aligned with definitions of computer literacy. Another term that is often used interchangeably with computer and ICT literacy is technology literacy. UNESCO (2011), for instance, makes use of this term and defines it as "enabling students to use ICT in order to learn more efficiently."

The shifting definitions of ICT — from one which is broad, encompassing a range of communication resources, back to a definition with a strong focus on computer technology — suggest a clear need for a terminology to describe the skills set related to the use of computer technology. This is emphasised by the fact that despite attempts to broaden definitions of computer/ ICT literacy to encompass critical skills, the use and understanding of these terms as functional skills persist. Rather than labelling it as "literacy," JISC (2014) has chosen to use the phrase "ICT proficiency" to describe the "fluency, capability, skills, [and] techno-literacy" needed for the use of computer/ digital resources. Digital literacy overlaps with ICT literacy in the sense that the functional skills set required to use ICT resources is a key requirement of digital literacy. As mentioned, our understanding of literacy is informed by a social practice approach. In this view, literacy is not a set of skills but a practice that is grounded in context, and skills are embedded in a practice (which is a goal-directed set of activities).

5.2.4   DIGITAL LITERACY

Digital literacy is a relatively new concept compared to the others, and it has only started to gain the attention of education policy leaders in the last few years. The concept emerged in the 1990s during the era of the Internet revolution. Like the other literacies, the use of the term has been confusing and conflicting. Scholars who have reviewed the concept have distinguished between those who view digital literacy as primarily concerned with functional skills and those who view it as concerned with a broader capacity needed to participate in a digital environment (Bawden, 2008; Eshet-Alkalai, 2004; Lankshear & Knobel, 2008). The two paradigms for digital literacy are explored further in section 2.1.

In 1997, Paul Gilster, whose seminal work has made a significant contribution to literature around this concept, argued that digital literacy is a cognitive phenomenon that goes beyond developing skills to use the Internet and networked, problem-solving tools — it is about "mastering ideas, not [computer] keystrokes" (Gilster, 1997, p. 1). He defined digital literacy as "the ability to understand and use information in multiple formats from a wide range of sources when it is presented via computers" (p. 1). For Gilster, digital literacy involved the ability to critically evaluate information (presented in different formats) and make decisions about how to use this information in different real-life contexts. The competencies he identified as key to digital literacy then were:

♦   Internet searching;

♦   hypertext navigation;

♦   knowledge assembly; and

♦   context evaluation.

It can be argued that the competencies outlined in information, media and computer literacy are more than adequate in accounting for the four competencies identified here. The question thus arises: Why was a new term deemed necessary? As Buckingham (2008) phrases it, "is [digital literacy] just a fancy way of talking about how people learn to use digital technology, or is it something broader than that? Indeed do we really need yet another literacy?" (p. 75). The fact that this term has emerged and is currently trending

clearly suggests that educators found the other terms inadequate for encapsulating the essence of digital literacy. More recent definitions of digital literacy provide a glimpse of why this is so.

Current definitions of digital literacy reveal a very different view of what this literacy involves. As an example, JISC (2015) defines digital literacy as "those capabilities which fit an individual for living, learning and working in a digital society."[7] The capabilities JISC outlines are:

♦ ICT proficiency;

♦ information, media, data literacy (critical use);

♦ digital creation, scholarship and innovation (creative production);

♦ digital communication, collaboration and participation (participating);

♦ digital learning and personal/professional development (learning); and

♦ digital identity and wellbeing (self-actualising).

Beyond functional and critical skills, the definitions and capabilities identified here propose a particular mindset, a way of being. In particular, the last

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7   See https://www.jisc.ac.uk/guides/developing-students-digital-literacy.

three capabilities outlined — an ability to engage in participatory culture, be a lifelong learner and manage a professional digital identity — render digital literacy remarkably different from the three competencies outlined in the above-described literature. The use of the term capabilities (in the JISC definition) in place of competencies demonstrates that digital literacy is not an end in itself or a skill to be mastered by everyone in the same way. This implies that people's capabilities in different digital literacy dimensions (operational, situated practice and critical engagement), within the same digital literacy practice, may vary.

As information, media, computer/ICT and digital literacy overlap in various ways, there has been immense confusion around the understanding and use of the terminologies. To better understand the implications of each concept described above, we have attempted to outline what separates the one literacy from another as well as how they intersect. We argue that the four literacies are not competing but in fact are necessary components of what it means to be literate in the 21st century. A summary of the four key concepts explored is outlined in Table 3. Interesting to note here is that these conceptualisations and representations of digital literacy are very different. These are not neat sets of areas in broad agreement, but messy and conceptually tangled areas that do not "talk to each other" particularly effectively.

	INFORMATION LITERACY	MEDIA LITERACY	COMPUTER/ICT LITERACY	DIGITAL LITERACY
Definition	the ability to locate, identify, retrieve, process and use digital information optimally (UNESCO, 2011)	the ability to access the media, to understand and to critically evaluate different aspects of the media and media content, and to create communications in a variety of contexts (European Commission, 2007)	a set of user skills that enable active participation in a society where services and cultural offerings are computer-supported and distributed on the Internet (UNESCO, 2011)	those capabilities which fit an individual for living, learning and working in a digital society (JISC, 2015)
Primary focus	information retrieval and assessment of quality	evaluation and production of media texts	skills in the use of computer-related technology	innovation, collaboration, lifelong learning
Competence	· identify · scope · plan · gather · evaluate · manage · present (SCONUL, 2011)	· decode · evaluate · analyse · produce	· keyboard skills · use of capture technologies · use of analysis tools · use of presentation tools · general navigation/UI skills · adaptivity/agility · confidence/exploration (Beetham et al., 2009)	· ICT proficiency · information, media, data literacy · digital creation, scholarship and innovation · digital communication, collaboration and participation · digital learning and personal/professional development · digital identity and well-being (JISC, 2015)
Conception of the individual	researchers; information users	consumers and producers	technology users	lifelong learner
Related literacies ("literacies under the umbrella")	data literacy	· visual literacy · audio literacy · video literacy · multimodal literacy	technology literacy	· network literacy · web literacy
Author/body	Koltay (2011); SCONUL (2011); UNESCO (2011)	Buckingham (2003); European Commission (2007)	Beetham et al. (2009); JISC (2015); Mason & McMorrow (2006); UNESCO (2011)	JISC (2015)

5.3   Defining Digital Literacy

As previously mentioned, a review of the literature on digital literacy reveals two key approaches to conceptualising digital literacy. On the one hand are those who view digital literacy as concerned with the affordances offered by digital technology tools and the mastering of technical skills; on the other hand are those who conceive of digital literacy as concerned with the social practices of meaning-making in the digital age (Gourlay, Hamilton, & Lea, 2014; Lea, 2013). Policy makers and learning technologists tend to adopt the former view, whilst literacy researchers tend to adopt the latter. Highlighting and reflecting on these two paradigms is important, as the view adopted affects how digital education leaders approach digital literacy and digital education. We discuss the two approaches to digital literacy below, outlining the potentials and limitations of each view.

Taking forward Street's (1984, 2001) two models of literacy, the literature reveals some tension between the conceptualisation of digital literacy (which is associated with the autonomous model of literacy) and digital literacies (which is associated with the ideological model of literacy). Street (2001) argues that the autonomous model of literacy is more technical and neutral (it does not take the context and culture into account), and it assumes that literacy "will have effects on other social and cognitive practices" (p. 7), whilst the ideological model takes context and culture into account and hence views literacy as social practices that vary from one context to another (p. 7). It is also, however, important to note that there is still debate within New Literacy Studies about how to handle the concept of "the digital." For example, Street (2001) and Lea (2013) have been conscious of associating any form of literacy with a digital channel (e.g., computer literacy), whilst others explicitly "recognize the significance of the digital in shaping the contexts within which literacy is to be understood" (Martin, 2008, p. 163), in addition to the social context.

The literacy model focuses on a "cognitivist, individualistic skills-based model of literacy" (Gourlay et al., 2014, p. 2) wherein skills are to be mastered by an individual, whilst the literacies model focuses on practices, and skills are embedded in practices. With the practices view, the context or community of practice plays a crucial role in determining the literacy practice and any skills that are drawn on as part of engaging in the practice. In fact, a "social practice" approach to literacy can also be said to complement earlier views of literacy that focus on more individualistic-cognitive or psychological approaches. Street's ideological model of literacy can be said to subsume the autonomous model by taking into account social phenomena and what is beyond the classroom/college/university, and by not negating the importance of skills per se. In addition to this, over time there are ongoing developments in technology, as well as shifts in what communities of practice may consider to be literacy, proficiency and practices. This therefore calls for lifelong learning in practitioners. In this context, Martin (2006) argues that "digital literacy is a condition, not a threshold" (p. 20). He emphasises that:

> [t]he assertion of digital literacy for any person or group is always provisional. Digital literacy is an ongoing and dynamic process — it is not a threshold that, once achieved, guarantees familiarity with the digital for ever after. . . . It is dependent on the needs of the situation; when those needs change, what constitutes digital literacy for that situation may change. (p. 20)

This means that the nature of digital literacy practices and the associated digital literacy capabilities are influenced by the situational needs of the practice.

In their attempt to accommodate both schools of thought in the Learning Literacies for the Digital Age (LLiDA) project, Beetham, McGill and Littlejohn (2009) focus on digital literacy practices:

> We use the term "(underpinning) practices" in the hope of side-stepping some of the debates about definition and philosophy that beset literacies research, and in particular the "paradigm contest" between cognitive and socially situated accounts of learning. Our focus in the study is on the pragmatic challenges that face learners and the institutions and educators that seek to support their development in practice as more capable human beings. (pp. 8–9)

Beetham et al. (2009) differentiate literacy from skill or competence; they assert that "literacy" involves:

♦   a foundational knowledge or capability, such as reading, writing or numeracy, on which more specific skills depend;

- a cultural entitlement — a practice without which a learner is impoverished in relation to culturally valued knowledge;

- communication — expressing how an individual relates to culturally significant communications in a variety of media;

- the need for practice — acquired through continued development and refinement in different contexts, rather than once-and-for-all mastery;

- a socially and culturally situated practice — often highly dependent on the context in which it is carried out; and

- self-transformation — literacies (and their lack) have a lifelong, life-wide impact (p. 9).

The above suggests a dialectical relationship between literacy practices (literacies) and the participant's identity. Street (2001) in his earlier work notes that in addition to the context, literacy practices are also underpinned by the being, identity, power and agency of an individual. Sharpe and Beetham (2010) also emphasise how digital identity can inform an individual's digital literacy practices and choice of digital tools to access and use. Outlining this two-way relationship is crucial for understanding the emerging contested nature of identities (plural) that are seen as multiple, splintered, constantly emergent and in complex, reflexive relationships with technologies of mediation, artefacts and networks of practice. That is, digital literacy practices are seen as ways of performing digital identities, whilst at the same time they can be viewed as means of creating digital identities in networks of practice.

Building on the LLiDA work, Sharpe and Beetham (2010) proposed a holistic pyramid model of eLearner development that distinguishes between an eLearner's functional access, skills, practices and attributes or identity. Sharpe and Beetham (2010) later developed this into a digital literacy development model (see Figure 2), which JISC has used quite extensively. Although this model does not focus on the different types of digital literacies and practices, it has been popular in the higher education context for its conceptualised hierarchy of how an individual develops and gradually makes informed choices.

FIGURE 2. "PYRAMID MODEL" OF DIGITAL LITERACY DEVELOPMENT.
Reproduced/adapted with permission from Sharpe & Beetham (2010).

In the pyramid, functional access includes learners' awareness of and access to hardware, software, networks, etc. Sharpe and Beetham (2010) argue that ownership of technology does not necessarily equate to access; the latter may be driven by students' need to meet their own goals. As a result of technology usage, students become confident in technical, information, communication and learning skills over time. Learners then gradually apply their skills in context (i.e., situated practices as responses to situational needs) and make informed decisions and choices about how to use technologies (Sharpe & Beetham, 2010). With the left-hand arrow, each learner's experiences and practices contribute to the formation of the learner's digital identity. The right-hand arrow illustrates how the learner's identity (their attributes) informs the learner's practices and drives their creative appropriate use of technology. Related to this discussion, Lankshear and Knobel (2008) warn us that due to the messiness of digital literacies evolving as a result of technology development, it is important to note that not all digital literacies are learnt the same way by all people or in a linear fashion. This understanding informs our curriculum development, too; we need to bear in mind that digital literacies are not fixed and are situated in contexts.

Based on our review of the literature, we suggest adapting the Multiliteracies Framework. The Multiliteracies Pedagogy is grounded in a theory of "design," which is concerned with how one transforms available designs (existing resources). As a theory of learning, it is understood to be transformative:

> The notion of design connects powerfully to the sort of creative intelligence the best practitioners need in order to be able, continually, to redesign their activities in the very act of practice. It connects as well to the idea that learning and productivity are the results of the designs (the structures) of complex systems of people, environments, technology, beliefs, and texts. (New London Group, 1996, p. 73)

The table below presents a summary of the Multiliteracies Framework, which forms the basis for our conceptualisation of the Digital Education Leadership curriculum we have proposed.

TABLE 4: MULTILITERACIES FRAMEWORK

Situated practice	Immersing the learner in authentic, meaningful practice (i.e., mastering practice).
Overt instruction	Active intervention on the part of the teacher and other experts in scaffolding learning activities (i.e., providing students with a set of tools to do their work).
Critical framing	Helping the learner review what is learnt in relation to particular social and cultural contexts (i.e., reflection on the practice), taking into account the power dynamics of digital technologies.
Transformed practice	Transferring what is learnt across contexts (i.e., taking what is learnt in the classroom to their own contexts).

5.4   Digital Education Leadership

5.4.1   DIGITAL EDUCATION

As we shift towards the age of digitalisation, digital education is emerging as a growing concern for educators and policymakers. Although there has been large-scale integration of technology into learning and teaching activities at schools and universities, by and large the outcomes have not been particularly effective. Teaching and learning remain for the most part grounded in traditional practices, and it is arguable that students are not being equipped with the necessary attributes to effectively participate in the workforce of the 21st century (Phillips, 2015). This project was born from recognising the need to develop leadership in this area.

We are not the first to note the need for leadership in the area of digital education. With the growing importance of digital literacy in educational agendas worldwide have come increasing calls for leadership development in this area (Jameson, 2013; McLeod, 2015; Mishra et al., 2016; Sheninger, 2014). In 2013, a special edition of the *British Journal of Educational Technology* was even dedicated to the topic of "e-leadership." Naturally, as with all emerging concepts, there is the question of what to describe and how to define it. In the following sections, we discuss why we have chosen to use the word "digital education leadership" over the more prevalent term "e-leadership," define digital education leadership and outline the qualities that are required of a digital education leader.

5.4.2   "DIGITAL EDUCATION LEADERSHIP" OVER "E-LEADERSHIP"?

Educational leadership is concerned with "visionary, motivational, and meaning-making social processes whereby a powerful individual or group emerges with the positional or reputational authority to unify others in maximizing the achievements of shared goals in education" (Jameson, 2015). It has been argued that educational leaders need the capacity to nurture a learning community (Caldwell, 2003) as well as to provide direction and exercise influence in achieving learning goals (Brooks & Normore, 2010). Questions have been raised as to whether it is necessary to conceive of a new term to describe digital education leadership or whether it can be subsumed under the more

general term "educational leadership." Jameson (2013), for one, asserts that it is necessary for the latter concept to emerge and be distinguished from other concepts of leadership:

> There is need for this rapidly changing function of leadership not just to be subsumed namelessly within wider discussion on leadership or management, largely because the process of learning about and undertaking effective development in leadership innovations in education is not automatic and cannot be guaranteed to be a routine part of leadership. (p. 908)

Certainly, a number of scholars have noted that a key difference between traditional concepts of educational leadership and leadership in the area of digital education is that whilst the former is rooted in a leader-centric style, the other necessitates a more shared, collective or distributed form of leadership (Franciosi, 2012; Jameson, Ferrell, Kelly, Walker, & Ryan, 2006; Mishra et al., 2016; Sheninger, 2014). To mark the difference between the traditional leader and a leader who can lead in the digital age, scholars generally agree on the introduction of a new term.

Various candidates for describing this new form of leadership have emerged, including e-leadership, EdTech leadership, ICT leadership, technology leadership, virtual leadership, digital leadership and online leadership (Jameson, 2013). Amongst these terms, "e-leadership" is particularly prevalent. Providing one of the earliest definitions, Avolio et al. (2000) defined "e-leadership" as "a social influence process mediated by AIT [advanced information technology] to produce a change in attitudes, feelings, thinking, behavior, and/or performances with individuals, groups, and/or organizations" (p. 617). It is necessary to highlight that the term originates from the field of business and management, where it used to describe leadership in the virtual environment. Though it has since been draw into the field of education, the term is still more commonly used in business to describe a leadership style that does not require a face-to-face, physical presence. In education, "e-leadership" refers to leadership in electronic supported learning (eLearning). The concept focuses on leadership in the effective implementation of educational technologies (Jameson, 2013; Mishra et al., 2016).

5.4.3   THINKING ABOUT DIGITAL EDUCATION LEADERSHIP

We understand that leadership in digital education is a complex process involving different players at different levels. For instance, researchers are needed to investigate the social practices of digital culture and investigate the possibilities and limitations of various educational technologies for informing best practice. Actions and advice from their research also have the potential to inform designers of new technologies. Policymakers and heads of organisations are needed to envisage and implement a given curriculum. Teachers are key players in operationalising a given curriculum and integrating educational technologies into their classrooms. Students can also be leaders through peer-to-peer learning. For this project, our focus is on the training of digital education leaders at the levels of (i) students, (ii) teachers and (iii) policymakers.

Mishra et al. (2016) identify three leadership models for educational technology, which, following Hughes, Thomas and Scharber (2006), they have termed the Replacement, Amplification and Transformation (RAT) framework. The three approaches are as follows:

1.   The Replacement or "More of the Same" Model

This model of leadership sees the leader introducing ICT to replace existing mechanisms in the teaching and learning environment. There is no change to the pedagogy at all; the new technology is merely brought in to replace the old technology. Under this leadership style, "technologies that align well with existing practices get accepted faster than ones that may disrupt or change existing approaches" (Mishra et al., 2016, p. 257).

2.   The Amplification or "Leadership Plus" Model

In this model, the leader brings in a new technology with the intention of replacing the purpose of the old technology, only to discover that the new technology has particular affordances that exceed the original or intended purpose. That is to say, the new technology not only replaces but also amplifies a given learning task. In this leadership style, however, the amplification or "plus" is accidental and not intentional.

3. The Transformation Model

In a transformational leadership style, leaders look beyond the affordances of new technologies and focus on gaining a better understanding of the social and interpersonal structures that guide organisations. This leadership style also sees a shift away from the traditional leader-centric form of leadership to a more distributed form.

Digital education leaders need to apply this third approach to leadership. What can be considered successful digital education leadership happens at the transformational level. The question arises of how to nurture a generation of transformational leaders. We propose a view of leaders that sees them as strategic designers. Digital education leaders need to have the strategic skills to utilise given resources to design the environment they want. To be strategic designers, they need to be equipped with particular knowledge, skills and attitudes.

Drawing on Sharpe and Beetham's (2010) model, Bennett (2014) developed a "Digital Practitioner Framework" (see Figure 3). Bennett conducted a study at a university in England to elicit the experiences of 16 lecturers who had adopted Web 2.0 tools for their teaching and learning practices. In this study, findings also revealed that functional access did not determine the use of technology; the lecturers only learned how to use particular technologies when they discovered that those technologies could be integrated into teaching and learning practices. This suggests a need for digital education literacy. The data also revealed that lecturers would experiment using technology for teaching and learning, and if the experiment turned out to be successful, the lecturers would develop confidence and, gradually, the identity of being digital practitioners (digital education champions). The identity and the belief in the pedagogical value of the technologies motivated some of the lecturers to learn new skills and acquire new practices, meaning they became more fluent in these digital education practices. These individuals could be described as digital education experts who are agile adopters of educational technologies. Although this work is in the higher education context, it gives a comprehensive perspective on how digital education leadership competencies can be developed at any educational level.
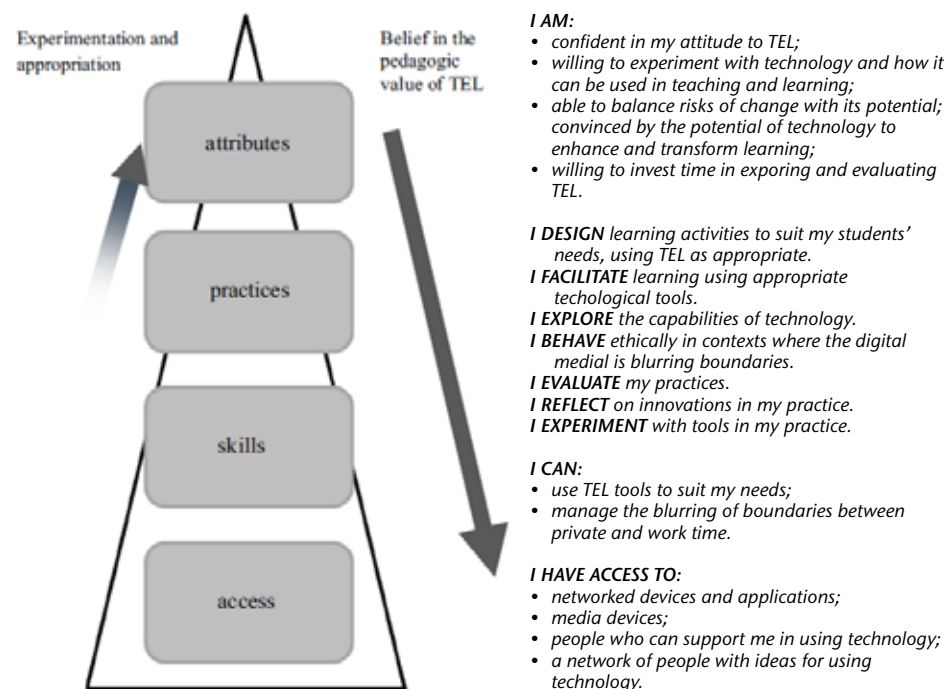
I AM:
- *confident in my attitude to TEL;*
- *willing to experiment with technology and how it can be used in teaching and learning;*
- *able to balance risks of change with its potential; convinced by the potential of technology to enhance and transform learning;*
- *willing to invest time in exporing and evaluating TEL.*

I DESIGN learning activities to suit my students' needs, using TEL as appropriate.
I FACILITATE learning using appropriate techological tools.
I EXPLORE the capabilities of technology.
I BEHAVE ethically in contexts where the digital medial is blurring boundaries.
I EVALUATE my practices.
I REFLECT on innovations in my practice.
I EXPERIMENT with tools in my practice.

I CAN:
- *use TEL tools to suit my needs;*
- *manage the blurring of boundaries between private and work time.*

I HAVE ACCESS TO:
- *networked devices and applications;*
- *media devices;*
- *people who can support me in using technology;*
- *a network of people with ideas for using technology.*

FIGURE 3. DIGITAL PRACTITIONER FRAMEWORK.
Reproduced/adapted with permission from Bennett (2014).

5.4.4   QUALITIES OF A DIGITAL EDUCATIONAL LEADER

Five existing frameworks for conceptualising the digital education leader are presented below.

5.4.4.1 Leadership roles and responsibilities

Primarily aiming at school principals, Flanagan and Jacobsen (2003) propose a leadership model that outlines five key roles and responsibilities, which are outlined in Table 5.

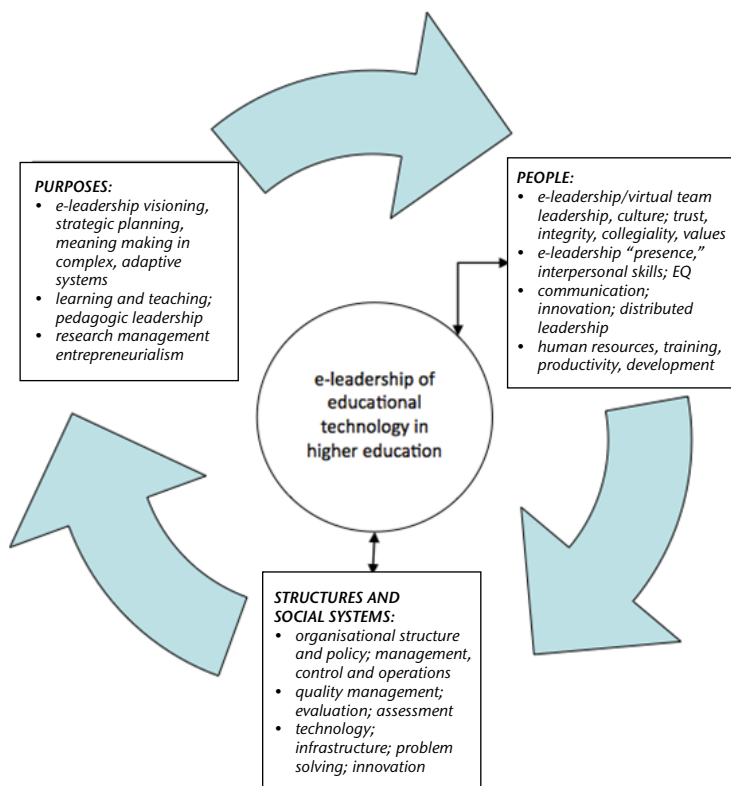**TABLE 5: FLANAGAN AND JACOBSEN'S (2003) LEADERSHIP MODEL**

ROLE	RESPONSIBILITY
Leader of learning	A leader of learning is required to demonstrate a thorough understanding of an ICT programme of studies, especially those outcomes that relate to higher levels of skill. Three learner outcomes are highlighted: (i) process of productivity, (ii) foundational operations, knowledge and concepts, and (iii) communicating, inquiring, decision making and problem solving.
Leader of student entitlement	In this role, the leader needs to addresses significant issues of equity in access to technology for all students.
Leader of capacity building	This role requires acting as a positive change agent.
Leader of community	This role requires involving the community, including parents and business partners, in achieving the goals of technology integration. It also entails communicating the schools' accomplishments and challenges to the community. Extending student learning beyond the walls of the school is also key.
Leader of resource management	This entails managing the resources necessary for technology integration. It also involves developing priorities for spending, as well as making decisions such as setting guidelines for purchasing hardware and software, and for where and how to put the technology.

5.4.4.2 e-Leadership framework characteristics

After reviewing a range of the literature, Jameson (2013) presented a leadership framework conceived of as operating at senior, middle and lower hierarchical levels in higher education. The framework comprises three key components: purpose; people; structures and social systems (see Figure 4).

1. Purpose: e-leadership visioning and strategic planning; meaning making and sense making in complex adaptive systems of higher education organisations.

2. Purpose: learning and teaching, pedagogic leadership.

3. People: e-leadership/virtual team leadership of collegiality, organisational values, behaviours and culture; trust; academic freedom; social, legal and ethical issues; diversity and equal opportunities; gender issues.

4. Structures and social systems: organisational structure and policy; management, finance and operations, including distributed leadership systems, speed of response and change-management skills.

5. People: e-leadership presence, interpersonal skills and emotional intelligence; empowering others.

6. People: communication skills and organisational relations, including speed of response; innovation; risk taking; distributed leadership; ownership:

7. Structures and social systems: quality management and monitoring; assessment and evaluation.

8. Purpose: research and enterprise management.

9. People: human resources, training, productivity and professional practice.

10. Structures and social systems: technology, support for infrastructure, problem-solving skills, information technology skills, innovation, risk taking. (Jameson, 2013 p. 909)

FIGURE 4. LEADERSHIP FRAMEWORK.
Reproduced/adapted with permission from Jameson (2013).

In the figure:

PURPOSES:
- *e-leadership visioning, strategic planning, meaning making in complex, adaptive systems*
- *learning and teaching; pedagogic leadership*
- *research management entrepreneurialism*

PEOPLE:
- *e-leadership/virtual team leadership, culture; trust, integrity, collegiality, values*
- *e-leadership "presence," interpersonal skills; EQ*
- *communication; innovation; distributed leadership*
- *human resources, training, productivity, development*

e-leadership of educational technology in higher education

STRUCTURES AND SOCIAL SYSTEMS:
- *organisational structure and policy; management, control and operations*
- *quality management; evaluation; assessment*
- *technology; infrastructure; problem solving; innovation*

5.4.4.3 Competencies of a digital leader

Ahlquist (2014) presents the following ten competencies of a digital leader:

1. Awareness of emerging technology tools and platforms.

2. Digital content analysis, sorting accuracy and quality from false or misinterpreted information.

3. Online self-awareness and reflection of digital profile (consciousness of self).

4. Establishing personal virtual boundaries, including privacy, time management and overall wellness (congruence).

5. Cultivating professional, strategic and career-oriented online branding (commitment).

6. Building a personal learning network (collaboration).

7. Integration of digital technologies into leadership presence (common purpose).

8. Cyber conflict resolution and mediation (controversy with society).

9. Digital decision-making strategies based on positive, authentic and constructive activity (citizenship).

10. Using social media for social good (citizenship).

5.4.4.4 Pillars of digital leadership

Sheninger (2014) defines digital leadership as

> establishing direction, influencing others, initiating sustainable change th[r]ough the access to information, and establishing relationships in order to anticipate changes pivotal to school success in the future. Leaders must learn to better anticipate the learning needs of students and staff, their desire for information from stakeholders, and the necessary elements of school culture that address both the Common Core Standards and essential skill set. They must also be "change-savvy." (p. xxi)

Sheninger (2014) stresses that digital leadership "is not about flashy tools, but a strategic mindset that leverages available resources to improve what we do while anticipating the changes needed to cultivate a school culture focused on engagement and achievement" (p. xxi). He outlines seven pillars of digital leadership (see Table 6).

TABLE 6: SHENINGER'S (2014) SEVEN PILLARS OF DIGITAL LEADERSHIP

PILLAR	DESCRIPTION
Communication	Focuses on types of information that can be communicated through various free social media tools and simple implementation strategies.
Public relations	Focuses on how leaders can form the foundation of positive public relations associated with their schools and create a much-needed level of transparency in an age of negative rhetoric towards education.
Branding	Leaders can leverage social media tools to create a positive brand presence that emphasises the positive aspects of school culture, increases community pride and helps to attract/retain families when they are looking for where to send their children to school.
Student engagement/ learning	Leaders need to understand that schools should reflect real life and allow students to apply what they have learned through the use of the tools they employ outside of school. A blueprint providing for effective technology integration ideas and strategies that are cost-effective and that focus on enhancing essential skills sets is: communication, collaboration, creativity, media literacy, global connectedness, critical thinking and problem solving.
Professional growth/ development	Focuses on how leaders can form their own personal learning network to meet their diverse learning needs, acquire resources, access knowledge, receive feedback and connect with experts as well as practitioners in the field of education. Digital leadership ensures that leaders are accessing the latest trends, research and ideas in the field.
Re-envisioning learning spaces and environments	Concerned with transforming learning spaces and environments that support essential skill sets and are aligned with the real world. Entails establishing a vision and strategic plan to create an entire school building dedicated to learning in an ever more digital world. In order to do so, leaders must be knowledgeable about the characteristics and dynamics that embody innovative learning spaces and environments.
Opportunity	Focuses on how to leverage connections made through technology and increase opportunities to make improvements across multiple areas of school culture.

5.4.4.5 The EDUCAUSE and JISC model for IT leadership

EDUCAUSE and JISC's (2015) model for IT leadership outlines ten roles for the IT leader (see Table 7). Whilst it is not necessary for the leader to possess all the skills outlined in the model, it is critical that the key skills be present amongst the team members.

TABLE 7: EDUCAUSE AND JISC'S (2015) MODEL FOR IT LEADERSHIP

ROLE	ROLE OVERVIEW	ROLE	ROLE OVERVIEW
Strategist	At the core of the model is the role of the strategist. IT is important to every part of the institution. To be an effective strategist, the IT leader must understand the organisation and provide both information systems and technology leadership that brings to life transformation across the organisation.	Master communicator	As a master communicator, the IT leader understands when and how to adapt messages differently for different people. The leader further knows how to tell a story, share a vision and be "multilingual," capable of speaking to technical audiences as well as to nontechnical, business, research and other audiences.
Trusted advisor	The IT leader establishes trust and credibility by building a solid track record — they follow up the vision for IT with effective delivery and execution.	Promoter/ persuader	Once an idea is formed of how best to support positive change within the institution, the IT leader works to influence a wide variety of stakeholders and convince them that the solution, process or technology is correct.
Visionary	The visionary communicates and promotes a clear vision for IT and persuades stakeholders to support future visions.	Coach	The IT leader is a coach for leadership, stakeholders and IT teams so that all are appropriately aware of and able to exploit the technology's potential.
Relationship builder	Working in parallel with winning trust from the rest of the organisation, the IT leader builds relationships and fosters links with a wide range of stakeholders, both within and outside the institution.	Team builder	It takes a high-performing team and strong coalition to get results; the IT leader builds consensus and inspires.
Change driver	The IT leader uses courage and resilience to overcome barriers and deliver the desired organisational transformation. There are two aspects to a change driver: executor and navigator. The navigator relates to the visionary primary role and refers to building trust and credibility when navigating the organisation and colleagues through a change process. The executor relates to the trusted advisor primary role, seeing the change through and making it happen.	Ambassador	As ambassador, the IT leader promotes a positive image of IT. Through contextual understanding, the IT leader is aware of political sensitivities and maintains a broad, even-handed view.
		Human	Finally, on the outside is the anchor role of human. The IT leader should be authentic and accessible and keep a work–life balance. It is important to remember that the process of becoming and being an effective IT leader is a marathon and not a sprint.

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6 Appendix B: Exemplar of a Curriculum Framework for Digital Education Leadership

PART 1: UNDERSTANDING DIGITAL EDUCATION

	DIGITAL LITERACY			
Activities Set	**Access**	**Operational**	**Situated**	**Critical**

Mobilising resources	• Access to ICT
	• Access to information resources
		• Skill in ICT proficiency
		• Basic information literacy (search for and access information)
			• Knowledge of the rules, roles, norms and genres of the use of digital resources for the particular context, e.g.:
			  - understanding of copyright, intellectual property and open access norms
			  - knowledge and use of OER
			  - knowledge of risks/privacy/data surveillance/terms and conditions/etc.
			• Production of text
				• Evaluate resources
				• Aggregate and curate resources
				• Create something new (e.g., create OER; build own website)

Developing digital identities	• Access to digital tools and networks	• Creating an online profile	• Owning/managing digital identities and digital footprint • Knowledge of the norms of expression (e.g., what is acceptable to share) • Knowledge of privacy and data ownership practices for the online tools and networks used	• Critical awareness of digital identities and the social media ecosystem • Creating new and empowering digital identities • Knowledge of the costs, responsibilities and ethics of expression
Engaging with network	• Access to digital tools and networks	• Choosing where to create online profile(s) (i.e., what conversations in which to participate)	• Interacting with others in different networks • Developing social presence • Building a personal learning network • Experiencing connectedness and community	• Understanding the rules of inclusion and exclusion (gatekeeping) • Understanding how power and influence operate in networks • Purposeful interaction with networks

Part 1 "Understanding Digital Education" consists of three modules:

Module 1: Mobilising Resources   Module 2: Developing Digital Identities   Module 3: Engaging with Networks

MODULE 1

Big Idea: Mobilising Resources

Essential questions:

What are the potentials and limitations of particular resources?

What are the rules, roles and norms of particular genres, and how do they affect how we engage in the genres?

How can we critically draw on available resources to produce something new?

LITERACY DIMENSIONS	CONCEPTS	CONTENT	CAPABILITIES	EXAMPLE ASSESSMENT
Access	· Copyright and OER licensing · OER repositories · Search terms	· Overview introduction to content licensing · Introduction to intellectual property aspects	· Capable of identifying OER · Capable of reusing, repurposing and redistributing OER under appropriate licences · Capable of validating content as OER (images, text, videos)	Students are given a task to find OER — e.g., images, videos, simulations (on a particular topic) from different repositories and share in an assigned folder.
Operational	ICT proficiency	· Overview introduction to ICT resources · Introduction to concept of affordances, with example of various ICT resources and their affordances in different contexts · Overview of different frameworks for analysing affordances of ICT resources	· Capable of utilising ICT resources · Capable of analysing the affordances of ICT resources · Capable of choosing appropriate ICT resources to use for a specific task at hand	Students are given a task in which they are required to use ICT resources. Afterwards, they need to write a reflective piece outlining the affordances of the resources.
	Basic information literacy	· Introduction to using ICT tools to search for information · Strategies for searching for relevant information · Strategies for evaluating credibility, relevance, bias, accuracy and currency of information	· Capable of identifying the need for information · Capable of using ICT tools to search for and access relevant information · Capable of selecting and evaluating information for credibility, relevance, bias, accuracy and currency	Students are asked to investigate a given topic using a number of resources. They are required to write a reflective piece outlining the credibility, relevance, bias, accuracy and currency of each resource.

Situated	Knowledge of the rules, roles, norms and genres of the use of digital resources for the particular context	· Overview of licences: copyright, intellectual property and open access norms · Examine case studies of copyright infringement · Overview of netiquette principles and in what contexts they are applicable	· Capable of identifying different rules guiding use of resources (e.g., licences: copyright, intellectual property and open access norms) · Capable of analysing digital texts	· Students are presented with a case study; they discuss whether the case constitutes an infringement of copyright. · Students are required to analyse the text, discussing how netiquette has or has not been applied.
	Producing text	· Introduction to different digital media (e.g., blogs, websites) · Overview of how to create texts in different digital media · Introduction to commonly used social media platforms · Strategies and protocols for engaging and interacting in different social media platforms	· Capable of creating digital texts · Capable of engaging in various social media platforms	Students are given a topic and required to investigate the topic across various social media platforms (e.g., write on the topic in a blog, tweet about it in Twitter, write a post for it on Facebook).
Critical	Evaluating resources in terms of power dimensions and social relations	· Introduction to who predominantly creates content, what their purpose is and where they come from · Overview of content creation and how this perpetuates or contributes to power and social relations · Overview of privacy issues involved in online interactions	· Capable of analysing resources in terms of power dimensions and social relations · Capable of demonstrating knowledge of privacy/data surveillance/terms and conditions	Students are presented with a case study which they are required to analyse and discuss in terms of power, social relations and issues of privacy.
	Aggregating and curating resources	· Introduction to ICT platforms which can be used to aggregate and create content · Overview of how to use these platforms to aggregate and create content	Capable of demonstrating ability to aggregate and curate resources	Students are required to create an online portfolio in which they demonstrate their ability to aggregate and curate resources.
	Creating something new (e.g., creating OER, own website, etc.)	Strategies for creating new resources as a result of curating and aggregating content	Capable of creating something from the aggregated and curated resources	From their aggregated and curated resources, students are required to create an OER or something similar.

Big Idea: Developing Digital Identities

Essential questions:

How can one go about creating an online profile?
What platforms are best for expressing what identities?
What are the norms of expression in the various platforms?
How can digital identities be managed across various platforms?

LITERACY DIMENSIONS	CONCEPTS	CONTENT	CAPABILITIES	EXAMPLE ASSESSMENT
Access	Challenges for creating an online profile	Understanding how issues of access affect the kind of profile one can create online	Capable of choosing the most appropriate format to create an online profile, given their technology access	Students can be asked to assess their technology access and discuss what kind of profile accounts they can create within that context.
Operational	Creating an online profile	· Introduction to various social media platforms · Overview of how to create profiles in the various platforms	Capable of creating profiles in different networks (e.g., LinkedIn, Facebook, etc.)	Students can be asked to create accounts and profiles across various social media platforms.
Situated	Managing digital identities and digital footprint	· Introduction to what kind of profile images are fitting to display on particular platforms · Introduction to writing short biographies for various social media platforms · Introduction to the "digital footprint" concept	Capable of personalising profiles (e.g., posting images, writing a self-introduction, etc. — filling in the contexts)	Students can be asked to fill in all the necessary requirements in their profile settings (from putting up images to writing a short autobiography).
	Knowledge of the norms of expression (e.g., what is acceptable to share)	Introduction to norms of expression in various social media platforms (e.g., hashtags in Twitter; understanding the use of "likes" in Facebook)	Capable of communicating and participating in different networks	Students can be asked to compose a tweet or post (depending on the platform selected).
	Knowledge of privacy and data ownership practices of online tools and the networks used	Introduction to privacy and data ownership practices of online tools and networks	Able to demonstrate knowledge of privacy and data ownership practices for online tools and networks	Students can be asked to reset their privacy settings on various social media platforms. They can also be asked to write a reflective piece discussing the privacy and data ownership practices of various online tools and networks.

Critical	Critical awareness of digital identities and the social media ecosystem	· Overview of how digital identities can impact one in the physical world (present case studies) · Overview of the implications of digital footprint (present case studies)	· Capable of describing the implications of digital identities (how digital identities can impact identities in the physical world) · Capable of describing the implications of digital footprint	Students can be asked to find a case study in which an individual has been positively or negatively impacted as a result of their online activities. Using the case study, they must write a reflective piece discussing issues of digital identity and digital footprint.
	Creating new and empowering digital identities	Strategies for creating empowering digital identities (i.e., strategies for creating a personal brand)	Capable of creating a professional identity in the network of choice	Students can be asked to improve on their online profile (create a professional identity).
	Knowledge of the costs, responsibilities and ethics of expression	Overview of the costs, responsibilities and ethics of expression (present case studies)	Capable of articulating the costs, responsibilities and ethics of expression in the network of choice	Engage in an exercise in which students are required to display their knowledge of the costs, responsibilities and ethics of expression in the network of choice.

Big Idea: Engaging with Networks

Essential questions:

How can networking enhance our learning experience?

What are the inclusion and exclusion rules of different networks?

How can we draw on networks for personal, social and economic development purposes?

LITERACY DIMENSIONS	CONCEPTS	CONTENT	CAPABILITIES	EXAMPLE ASSESSMENT
Access	Access to digital tools and networks	Introduction to issues of access regarding digital tools and networks	Capable of demonstrating knowledge of how to follow the terms and conditions in order to access the network (e.g., some networks are only accessible by invitation)	Students can be asked to write a reflection regarding gatekeeping practices involved in social networking.
Operational	Choosing where to create online profile(s) and what networks to join (i.e., what conversations to be part of)	Introduction to how to create groups and join groups geared towards one's interests or profession	Capable of finding networks to join and creating profiles in networks	Students can be asked to find networks of value to join.
Situated	Developing social presence	Strategies for developing a social presence (e.g., making the self visible through re-tweeting, sharing, posting)	Capable of making oneself visible by contributing to information sharing	Students can be asked to share information online.
	Interacting with others in different networks	Strategies for social networking	Capable of interacting with members from various networks	Students can be asked to interact with members of the network joined.
	Building a personal learning network; experiencing connectedness and community	Strategies for engaging with members of the network in conversation	Capable of engaging with members in conversation	Students can be asked to participate/ communicate in and contribute to the network joined.
Critical	Understanding the inclusion and exclusion rules (gatekeeping) of different networks	Overview of how gatekeeping works in various social networking platforms	Capable of describing specific networks' rules of inclusion and exclusion and the implications these have for participation	Students can be asked to write a reflective piece, articulating specific networks' rules of inclusion and exclusion and the implications these have for participation.
	Understand how power and influence operate in networks	Overview of how power and influence operate in networks	Capable of discussing how power and influence operate in a particular network	Students can be asked to analyse a network, discussing how power and influence operate within it.

PART 2: UNDERSTANDING LEADERSHIP IN DIGITAL EDUCATION

	LEADERSHIP			
Activities Set	Enhancing Access	Making Informed Decisions	Developing Capacity	Cultivating Innovation

Mobilising resources	· Raising awareness of how people can access resources
	· Making local and global resources visible
	· Knowledge of issues in equity of access to resources
		· Conducting:
		  - Consultation and needs analysis
		  - Environmental scans
		  - Technology landscape scan
		  - Research
		  - Advocacy
		  - Allocation of resources
		· Ensuring equity of access to resources
		· Consulting and communicating with stakeholders on how best to utilise resources
		· Understanding the implications of decisions
			· Training and developing people's capacity (e.g., through a communities of practice approach)
			· Communicating with stakeholders about how best to mobilise resources
			· Developing people's ability to "design" (be able to recontextualise and transform existing resources to suit their own context)
				· Critical assessment of existing and possible resources involves:
				  - Creative synthesis of options (designing pedagogic interventions)
				  - Future proofing
				  - Evaluation and challenge

Developing digital identities	Making visible approaches to developing digital identities	Making informed decisions on how best to develop their (individual or institution) identity/ image	· Fostering digital identities · Raising awareness of digital well-being	Cultivating digital well-being (this is the leadership in the digital role)
Engaging with network	Making visible learning networks	Making informed decisions on how best to interact with the networks in order to benefit from the connection	Making use of the networks to develop capacity (e.g., getting advice from experts on how best to train individuals in their institution; sharing resources)	Critically engaging with the networks to produce something new (e.g., doing collaborative work with selected individuals from the networks)

The left vertical axis of the table is labelled DIGITAL EDUCATION.

Part 2 "Understanding Leadership in Digital Education" consists of four modules:

| Module 1: Enhancing Access | Module 2: Making Informed Decisions | Module 3: Developing Capacity | Module 4: Cultivating Innovation |

Big Idea: Enhancing Access

Essential question:

How can we raise awareness in the following areas?
· mobilising resources
· developing digital identities
· engaging in networks

ACTIVITIES SET	CONCEPTS	CONTENT	CAPABILITIES	EXAMPLE ASSESSMENT
Mobilising resources	1. Raising awareness of how people can access resources 2. Making local and global resources visible	1. Overview of resources available for teaching and learning 2. Introduction to communication strategies 3. Introduction to strategies for creating awareness	1. Capable of demonstrating the ability to use different communication strategies and platforms 2. Capable of guiding people about where and how to access resources 3. Capable of making visible available local and global resources	Write a plan discussing how the leader plans to make resources available to his/her community.
	Knowledge of issues in equity of access to resources	Overview of issues in equity of access to resources and their implications for digital education	Capable of demonstrating awareness about equity/inequity of access to resources	Write an essay outlining issues of equity of access relevant to the leader's context.
Developing digital identities	Making visible approaches to developing digital identities	Overview of content on managing digital identities and digital footprint	Capable of demonstrating an understanding of how to develop, manage and express identities appropriate to various digital spaces	· Create a professional identity online (if the leader does not already have one). · Write a reflective piece articulating the implications of digital identities and digital footprints. · Write a plan for how the leader will make visible approaches to developing digital identities in his/her community or institution.
Engaging with network	Making visible learning networks	Overview of strategies for networking	Capable of identifying learning networks relevant to the context in which they are leading	Create a list of learning networks.

Big Idea: Making Informed Decisions

Essential questions:

What are the strategies for conducting research?

What are the strategies for approaching team work?

ACTIVITIES SET	CONCEPTS	CONTENT	CAPABILITIES	EXAMPLE ASSESSMENT

Mobilising resources	· Conducting:
	  - Consultation and needs analysis
	  - Environmental scans
	  - Technology landscape scans
	  - Research
	  - Advocacy
	· Allocating resources
		· Introduction to SWOT analysis
		· Strategies for conducting research
		· Strategies for writing a funding proposal
		· Introduction to resource management
			· Capable of conducting a SWOT analysis of the community of practice that the leader is supporting
			· Capable of conducting an analysis of the affordances of available resources to meet the community's needs
			· Capable of participating in and applying current research to digital education initiatives
			· Capable of demonstrating the ability to write a funding proposal
			· Capable of demonstrating the ability to manage resources (budgeting, allocation)
				· Conduct a SWOT analysis.
				· Write a funding proposal for the project.
				· Present a plan outlining the allocation of resources.

	Ensuring equity of access to resources	Overview of issues of equity and access to resources (e.g., read Selwyn's 2013 work)	· Capable of managing resources whilst bearing in mind equity issues (physical, epistemological, etc.) · Capable of providing resources in different formats (low-tech; adaptable; source codes for multimedia; transcripts)	Write a reflective piece discussing how issues of equity can be taken into account in the leader's own context.
	Consulting and communicating with stakeholders on how to best utilise resources	Introduction to strategies for communicating and negotiating	Capable of working in a team	Engage in a teamwork assignment.
	Understanding implications of decisions	· Introduction to strategies for decision making · Introduction to strategies for critical reflection	Capable of conducting an impact assessment and creating a risk management strategy	Write a reflective piece outlining the possible implications of the leader's decisions or actions.
Developing digital identities	Making informed decisions on how best to develop their (individual or institutional) identity/image	Introduction to facilitation (relevant to developing digital identities)	· Capable of coaching/facilitating others in developing, managing and expressing identities appropriate to various digital spaces · Capable of constructing case studies and contextual examples of digital identity	Write a plan for how the leader intends to develop the digital identities of his/her community.
Engaging with network	Making visible learning networks	Overview of strategies for networking	Capable of identifying learning networks relevant to the context in which they are leading	Create a list of learning networks

Big Idea: Developing Capacity

Essential question:

What strategies are there for effective facilitation?

ACTIVITIES SET	CONCEPTS	CONTENT	CAPABILITIES	EXAMPLE ASSESSMENT
Mobilising resources	Training and developing people's capacity (e.g., through a communities of practice approach)	Strategies for facilitation	· Capability in facilitation · Capability in providing professional learning and professional growth opportunities for self and staff that broaden and diversify existing digital literacy as well as digital education knowledge and skill sets	Engage in an activity that entails facilitation.
	Communicating with stakeholders on how best to mobilise resources	Strategies for communicating with stakeholders	Capacity in coaching others in how to mobilise resources (e.g., emotional intelligence, empathy, listening skills, reflection, questioning, providing feedback using tact and diplomacy)	Engage in an activity that entails coaching others in how to mobilise resources.
	Developing people's ability to "design" (i.e., recontextualise and transform existing resources to suit their own context)	Strategies for designing and redesigning resources (creative thinking)	· Capacity to help others think outside of the box (e.g., design-based thinking) · Capacity to develop a networked communication strategy	Engage in an activity that entails facilitating others in "thinking creatively."
Developing digital identities	Fostering digital identities	Strategies for fostering digital identities	Capacity to facilitate others in developing healthy digital identities	Engage in an activity that entails facilitating others in developing healthy digital identities.
	Raising awareness of digital well-being	Strategies for raising awareness of digital well-being	Capacity to raise awareness of digital well-being	Engage in an activity that requires the leader to raise awareness of digital well-being.
Engaging with network	Making use of the networks to develop capacity (e.g., getting advice from experts on how best to train individuals in their institution; sharing resources)	Strategies for making use of networks to develop capacity (provide case studies)	· Capacity to source networks for the purpose of developing capacity in one's institution/context · Capacity to source, from one's network, professional learning and growth opportunities for self and staff that broaden and diversify existing digital literacy as well as digital education knowledge and skill sets	Engage in an activity that requires the leader to source from networks in order to develop something.

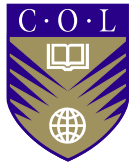**Big Idea: Cultivating Innovation**

Essential questions:

Why is it important to reflect on our leadership style and practice?

What strategies are there for building networks and initiating collaborations?

ACTIVITIES SET	CONCEPTS	CONTENT	CAPABILITIES	EXAMPLE ASSESSMENT
Mobilising resources	· Critical assessment of existing and possible resources involves: - Creative synthesis of options (designing pedagogic interventions) - Future proofing · Evaluation and challenge	· Strategies for assessing resources · Strategies for designing pedagogies · Strategies for future proofing	· Capacity to evaluate and reflect on practice as well as ways of improving it (critical reflection and redesign of resources) · Capacity to achieve cost effectiveness and efficiency through data-driven decision making	Leaders can be given a practical scenario (which could be their own scenario) in which they will need to evaluate and future proof the case study and design a pedagogic intervention.
Developing digital identities	Cultivating digital well-being	Strategies for cultivating digital well-being	Demonstrate the ability to cultivate digital well-being in the community the leaders are serving (model digital well-being)	Leaders can be asked to write a reflection outlining the importance of digital well-being for the community they are leading. Next, they can be asked to write a plan outlining how they will cultivate digital well-being within that community.
Engaging with network	Critically engaging with the networks to produce something new (e.g., doing collaborative work with selected individuals from the networks)	Strategies for engaging in collaborative work	Capacity to initiate and lead a collaborative project with selected individuals from one's network (demonstrate criticality in engaging with networks to create)	In taking this course, the leaders would have presumably formed bonds with other leaders. The leaders can be asked to work in pairs or in teams to come up with a project relevant to their context.