The difference between Digital Learning and Digital Literacy?
- a practical perspective

Dr John Turner
Canadian International School, Hong Kong
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Introduction

“Digital Literacy has become one of the main competencies in the 21st Century”
(Newry & Veugelers 2009)

Last year my school finalized a plan for infusing digital technologies across the K-12 curriculum. Digital Learning Infusion (DLI) drew on the Florida Technology Integration matrix (fcit.usf.edu/matrix), and built on a previous plan that included the integration of 1:1 laptops from Grades 5 through 12, development of a teacher pd program, specialist support, and various curriculum initiatives. Key elements of this new stage includes further empowering students and teachers as learners, evaluating learning progress to inform action, and streamlining effective communication across the school community.

One consideration emerging has been Digital Literacy up against Digital Learning. Digital literacy has taken on increasing importance as educators look to meld 20th century structures with new digital related skills (Voogt et al 2011). This could have important implications for broadening the learning opportunities provided for students and teachers. With this in mind, this paper investigates the relationship between digital literacy and digital learning in support of practical in-school use of digital technologies for teaching and learning.

Background to Digital Literacy

“Digital Literacy is ... the ability to understand and use information in multiple formats from a wide range of sources when it is presented via computers” (Gilster 1997)

Traditionally literacy was “conceived as social practices and conceptions of reading and writing” (Street 1984). This is evident in a 3Rs curriculum with its text-focused content. More recently the OECD (2006) defined reading literacy as “understanding, using and reflecting on written texts, in order to achieve one’s goals, to develop one’s knowledge and potential and to participate in society.”

It goes on to note

“definitions of reading and reading literacy have changed over time in parallel with changes in society, the economy and culture. The concept of learning, and particularly the concept of lifelong learning, has expanded perceptions of reading literacy and the demands made on it. Literacy is no longer considered an ability only acquired in childhood during the early years of schooling. Instead, it is viewed as an expanding set of knowledge, skills and strategies which individuals build on throughout life in various situations, and through interaction with their peers and with the larger communities in which they participate.”

For many digital literacy forms part of this expansion. The OECD (2009) PISA evaluation of digital literacy defined Digital Reading Literacy as “evaluating information on the Internet, assessing its credibility, and navigating web pages.”

Others, though, have taken a wider perspective. Gardner’s (1983) work on multiple intelligences sought to widen considerations of intelligence. Influenced by this Adams (2004), Eshet-Alkalai (2005) and Solez (2009) sought to develop frameworks for digital intelligence or digital literacy.

Digital literacy has come to be viewed as everything from a basic skill for personal transformation to an interconnecting hydra of components (Futurelab 2010). To Thomas (2011) it comes with a need for transformative pedagogies, while Gee (2003) sees it as a “function of social practice, social context and discourse.” To Resnick (2002) it is analogous to learning a foreign language.

Media Literacy (or Digital Media Literacy) is another term used by some synonymously with digital literacy (Belshaw 2011). Recently Briggs and Makice (2011) put forward Digital Fluency as a logical objective for learning through digital technologies. They see digital literacy as a step below the required level needed to reliably achieve desired outcomes through technology use. Meanwhile the European Joint Research Centre (JRC 2012) is developing digital competence frameworks to link with other competencies such as “language, mathematics, learning to learn and cultural awareness.”

Some prefer more restricted meanings, such as focusing on effective use of ICT exclusively (Koltay 2011) or on the need to bring digital skills to the 66 million Americans deemed by the Federal Communication Commission as lacking digital access / digital literacy (Southerland 2012). Others embrace wider contexts to take-in the ability to make sense of and effectively utilize emerging technologies (Shapiro and Hughes 1996). Digital literacy
also overlaps Information Literacy, Visual Literacy and Media Literacy as the importance of visual communication and information has taken on more influence (Koltay 2011).

Perhaps Belshaw's (2011) PHD investigation provides an all embracing set of digital literacy considerations (the eight Cs):

1. cultural: what is the context of experiences?
2. cognitive: how is the mind expanded?
3. constructive: what is new in such constructions?
4. communicative: how is communication enhanced?
5. confident: how is failure addressed constructively?
6. creative: how can we move beyond the canon?
7. critical: how are conventions critically addressed?
8. civic: how is a civil society developed?

He points to the complex, contextual nature of digital literacy requiring identification of learning objectives achievable within specified domains. Educational researchers such as Voogt et al (2011) also see digital literacy as requiring an understanding of the "interplay between technology and society to understand the technological principles needed to develop relevant solutions and achieve goals", contending that "digital literacy should not be regarded as a separate set of skills, but instead embedded within and across the other 21st century skills and core subjects." This is supported by recent Horizon Reports (NMC 2009, 2012) which contend that digital literacy is not about the tools, but thinking critically about how technologies shape identities and cultures.

The European Union views digital literacy as "an evolving agenda" within political and cultural contexts (Shapiro 2009). Beetham (2011) summarizes this through a visual map (fig 1), while Martin (2006) provided a definitive explanation.

"Digital Literacy is the awareness, attitude and ability of individuals to appropriately use digital tools and facilities to identify, access, manage, integrate, evaluate, analyse and synthesise digital resources, construct new knowledge, create media expressions, and communicate with others in the context of specific life situations, in order to enable constructive social action; and to reflect upon this process"
There are others, though, such as Jackson and Crawford (2008) who see digital learning as no different to required general literacy. Finally, those advocating a more student-centered, student empowered approach to formal education see in digital learning the potential for transformation based on social/cultural and constructivist principles (Learning Commons 2012, Swan 2005). Digital learning remains in the eye of the beholder.

Meanwhile, the value of digital technologies to support learning is becoming more established, with research-backed conclusions that digital technologies do affect not only how students learn, but also how they socialize and communicate (Knezek, Kwok-Wing Lai & Khaddage 2011). An oft heard mantra that technology can help promote effective learning is joined with beliefs that technology has transformed, or is transforming, the teaching-learning process (Resta 2011, Purcell et al 2012). Within this there is a community expectation expressed by parents, employers, and the wider community that the education system needs to produce technologically fluent students, who can use a wide variety of digital technologies across disciplines and professions, and who have the behaviours and knowledge that will enable them to use emerging technologies. (Duncan-Howell 2012)

A Framework for Digital Literacy

My investigation arrived at the following subjective differentiation between the two DLs.

Digital Learning relates to the tools used and teaching and learning processes undertaken. This includes new learning wrought by new technologies, such as processing web information, software-processing skills, digital problem-solving skills and connected learning (digital and non-digital). It also includes progressing more traditional processes such as redrafting, modeling and information storage/access.

Digital Literacy, while it overlaps digital learning, constitutes a series of developmental levels not unlike reading. A basic level to satisfy would be digital competence. School has a role to play in the formal development, while elite levels are apparent. Literacy elements go beyond particular software skills to include extension, adaptability, problem-solving, connection and reflection. Pathways are culturally determined and valued.

For some there may appear to be little or no difference, only a question of semantics. But once again, comparing to reading, is having basic reading skills different from being able to apply critical thinking across a range of texts? BAnderson and Krathwhol (2001), taking into account the impact on learning wrought by digital technologies, updated Bloom’s taxonomy to include Creating as the new top level. Reading literacy, as with digital literacy, is strongly connected to what one can achieve through such literacies.

In a previous investigation into digital learning (Turner 2010) I identified five areas (and four levels) relevant to digital learning. These reflected a Threshold Concept analysis (Meyer and Land 2003).

<table>
<thead>
<tr>
<th>Planning</th>
<th>Logico-visual</th>
<th>Information Organization</th>
<th>Re-chunking</th>
<th>Problemizing</th>
<th>Connecting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level 1</td>
<td>Reactive or non-planned actions</td>
<td>Track simple screen choices</td>
<td>Access and store everyday data and information</td>
<td>Use simple software* to follow steps provided</td>
<td>Apply simple one-step problem solving for everyday digital problems</td>
</tr>
<tr>
<td>Level 2</td>
<td>Construct and communicate simple readable plan</td>
<td>Purposefully manipulate single objects</td>
<td>Locate, evaluate, reference, store organized information and sources</td>
<td>Use ‘natural’ or ‘straight-forward’ * software tools independently</td>
<td>Solve general everyday digital problems</td>
</tr>
<tr>
<td>Level 3</td>
<td>Plan, apply and evaluate to professional Gantt level</td>
<td>Integrate layers and linked objects</td>
<td>Utilize more advanced software * features</td>
<td>Use online help to extend problem-solving domain</td>
<td>Collaborate with others on projects and problem-solving</td>
</tr>
<tr>
<td>Level 4</td>
<td>Higher order spatial / abstract manipulation</td>
<td>Initiate and effectively conduct professional searches</td>
<td>Utilize any general software’s professional features</td>
<td>Handle own systems and connect with other systems to solve problems</td>
<td>Work within professional teams utilizing specialist skills</td>
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</table>

fig 2. Digital learning framework based on threshold concept analysis
What is now apparent is that Digital Literacy requires widening the consideration to include cultural and social aspects such as adaptability, reflection, entrepreneurialism and cultural relevance.

A practical starting point might be taken from Gillen and Barton’s (2010) Digital Literacies research briefing that included a framework for contextualizing digital literacies:

<table>
<thead>
<tr>
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<tr>
<td>Collaboration problem solving</td>
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<td>Multidisciplinary tool creation</td>
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<td>Authenticity and access</td>
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**fig 3.TLRP-TEL project Framework for contextualising Digital Literacies**

**What Digital Technologies can provide**

Technologies can provide new personal learning mechanisms: new literacies, new opportunities, new challenges, and new values:

**New learning from naive to empowered:**
- planning
- logic-visual screen manipulation
- information organisation
- purposeful re-chunking with new software
- problemizing as a basic component of digital use
- connecting as an ecology of learners (Turner 2010)

**New opportunities**
- global audiences
- global connections
- creating dynamic records of learning
- design thinking
- visible learning
- learning from error

**New challenges**
- catering for teacher diversity through teacher learning and teamwork
- filtering skills
- personal choice of technologies integrated into common learning frameworks
- citizenship encompassing digital domains

**New Values**
- to what levels personal choice can be increased?
- what value collaboration and teamwork in diverse learning environments?
- how far to break down classroom walls?
- what level of personal choice for teachers?
- what value student personal interest and prior knowledge?
- what learning to value and in what ways?

Putting this all together could help develop a digitally literate learning community.

**Some issues to ponder**

For digital literacy in school environments several issues warrant specific consideration and provide further evidence for not just seeing reading as synonymous with digital literacy. These include:

1. **Rates of Change**
   - Moore’s Law, a non-scientific pronouncement that nevertheless has generally held since the mid-1960s, contends that computing processing power doubles about every 18 months. This has
underpinned revolutionary societal change with computing power impacting on every facet of human endeavor. To keep abreast of opportunity requires a flexibility of mind and entrepreneurial mind-set. To be digitally literate at the higher levels is as much about opportunity, aptitude and attitude as formal education system progression.

In schools the impact of fast-changing technologies has led to ongoing interest in the frameworks needed to add value. The International Society for Technology Education’s (ISTE) Essential Conditions as “necessary conditions to effectively leverage technology for learning” provide 14 conditions, including the importance of shared vision and a focus on student-centered learning. Cox et al (2011) remind us that “rapid growth and changes in technology leave researchers, as well as teachers and learners, struggling to keep up with functionality and educational potential.” This requires embedded effective change management approaches (Fullan 2013).

(2) Informal learning
Jay Cross (2006) has written extensively on the impact of personal technologies on learning. This relationship has increasingly impacted on schools. But Sutherland (2008) warns us about relying too much on out-of-school informal learning for disadvantaged learners. Even in well-off schools diversity of experiences beyond school, rather than generalizations or individualizations, need careful consideration. Informal Learning, though, is increasingly recognized as affecting student learning potential even if “nebulous and often difficult to measure” (Cox et al 2011).

Young people may be “adept at internet searching, using social networking and content download sites.... (but) much of young people’s use continues to be passive viewing of online content” (Kirkman 2012). We need to resolve to what extent schools wish to develop digital Consumers, Curators or Creators?

(3) Diversity and Personalization of choice
With increasing rates of change and personal computing power has come a widening array of fast-changing technologies, leading to increased individual preference by students and teachers. No longer can schools claim to be the centre of standardizable determinants. Increasingly home and personal computing power has in many schools out-stripped what schools can offer through centralised, standardised approaches.

Digital literacy therefore is increasingly technology-independent with personalized pathways. Transmission has been replaced by Connection as a cornerstone of learning, reflecting Siemens’ (2006) advocacy of Connectionism. Learning communities have evolved into small, inter-connected and highly-adaptable areas of common interest.

(4) Generational differences
Pretzky (2001) and Tapscott (1997) set the ball rolling with their claims that those raised in the modern digital world, so called Digital Natives or Net Geners, possessed attributes and attitudes that set them apart from previous generations; so called Digital Immigrants. This led to calls for new educational paradigms to fit new needs. This is contentious and has been accused of seeking moral panic on unsubstantiable claims (Selwyn 2009 in Kirkman 2012). But the impact of (1) - (3) has seen a flattening of learning environments, with educational researchers calling for more control for students in the learning process (Knezek, Kwok-Wing Lai & Khaddage 2011).

(5) Lifelong learning
There is increasing recognition that lifelong learning, with all its challenges and opportunities, requires formal learning considerations beyond the limiting view of school's industrial antecedents. Neuroscience has already established that people retain the capacity to learn through and beyond middle age and that learning is in fact conducive to good health and a good life (Geake & Cooper 2003).

(6) The learning process
Researchers point to how new technologies are changing how knowledge is represented and codified (Cox et al 2011). They point to knowledge that is now dynamic and unstable, where balance is nebulous, and new relationships between formal and informal. Marshall McLuhan (1964) exemplified this with his statement that “we shape our tools, and thereafter our tools shape us”.

(7) Assessment
While assessment has followed curriculum intent and cultural priorities, school systems have nevertheless increasingly incorporated digital literacy and/or digital learning considerations. An academic view put forward by Eshet-Alkalai (2004) identified five types of literacy - photo-visual, reproduction, information, branching, and socio-emotional - which was used to build a basic assessment structure for digital learning (Turner 2010).

A more systemic approach has been put forward by the Australian Curriculum Assessment and
Reporting Authority in its National Assessment Program - ICT Literacy in Years 6 and 10 (ACARA 2011) which has reported on student interest, enjoyment and confidence.

(8) Teacher diversity
While others might veer towards digital technologies in school education as optional, perhaps even novelty or baby-sitter; or as a variation to a traditional teacher-didactic approach, or because they represent ‘real-world’ metaphors, some advocates take a more active line

● flattening their classroom to become co-learners with their students
● valuing learning from new sources, including students
● risking new technologies to evaluate new learning possibilities
● seeking ‘socially-based, un-tethered and digitally rich’ learning environments for themselves and their students (Speak Up, 2012)

While, however, the value of school learning is constrained by industrially structured content linked to a test-focused assessment, alternative values will too often have to continue to swim against the tide or seek harbors of personal satisfaction.

Teachers, like other sections of society, represent a range of attitudes towards changing technologies, exemplified by Rogers (1962) model of diffusion of innovations where the characteristics of “late adopters are profoundly different from those of early adopters” (McKenzie 1999).

(9) Specialized v Generalized
There are those who will specialize in particular technologies, taking on and demonstrating advanced features and creating advanced products. A non-systemic approach to developing teacher specialization and broken pathways through school has hampered the role of school, the potential of students and the priorities of teachers. A conundrum ever since Bill Gates took on programming pre-teen as an outlier (Gladwell 2008).

Curriculum Importance

Schools are guided by their curriculum, and the level of freedom afforded can vary between systems, schools or even teachers. For this investigation, as for any, an important consideration is curriculum structure. The practical responsibilities of schools are not helped by calls for radical restructuring of school (Davis, Eickelmann and Schulz-Zander 2011) with a preference for this or that (sometimes fad) technology as savior or inevitability.

The problem of obtaining worthwhile educational research support when dealing with fast developing and changing technologies has been noted (Roblyer 2005, CERI 2012).

While there exists widespread support in education for digital technologies as an enabler (MCEETYA 2008), how to go about maximizing value is constantly debated. A recent UK Study, International Comparison of Computing in Schools (NFER 2012), highlighted the variability in system approaches to digital technologies, from discrete subject studies to cross-curricular tool expectations. An absence of any reference to digital literacy is noteworthy.

In my school the International Baccalaureate (IB) is in place across K-12 (PYP, MYP and DP), in conjunction with Ontario Curriculum responsibilities. This is particularly significant. An IB (2011) document, The role of ICT in the PYP provided a framework of outcomes that the school had used to create a scaffolded approach to digital infusion for learning. DLI is indeed apparent in the curriculum-linked, teacher led scaffolds. In support, online virtual learning environments that connect digital tools support digital learning landscapes, while student iFolios linked to curriculum approaches to learning (ATL) and areas of interaction (AOI) enable Bloom’s higher order thinking and learning approaches to be supported.

Balancing it all together

To build digital literacy beyond digital learning several elements are required

1. **Teacher Support.** Teachers need classroom support, be it at-hand or time to connect. Students can also be a wonderful resource as flattened classrooms facilitate peer learning. But ownership and commitment cannot be presumed. A positive teacher attitude to digital learning, both personal and in the classroom, is paramount.

2. **Curriculum Validity.** The importance of IB curriculum direction is detailed in this paper. Curriculums need to be clear and supportive of diversity, while balancing vision, risk and requirement.

3. **Teacher Learning.** While the importance of the teachers as manager of learning environments remains crucial, it is no longer acceptable to rely just on being the unchanged central source. Pedagogical shifts, as well as the continually changing nature of the digital age, means that new teacher learning structures are required in schools; melding and connecting the curriculum with the informal.
4. **Assessment Value.** Digital Literacy requires tasks to support and demonstrated development that is valued within the school and beyond. Support for eportfolios (iFolios) and peer assessment can be significant (Resta 2011).

5. **Change Strength.** The ISTE Essential Conditions can support a school’s level of digital literacy through introspection.

6. **Working with Diversity.** Flattened learning environments within classrooms and beyond have been increasing over time. As teachers gain more confidence their preferences are likely to diverge. This impacts on leadership and support structures.

As stated previously, a digital literacy focus must include problem-solving situations to gauge fluency, adaptability, as well as freedom for personal choice. Taking Dewey’s (1909) learning by doing philosophy, the next step courtesy of digital technologies may be to extend this value to what can be done with such learning and through creating learning loops advance understanding. In this way building on to what Voogt et al (2011) see as the three knowledge types: “Foundational knowledge (what we know), Meta knowledge (what we do) and Humanistic knowledge (what we value).”

### In-school considerations

Just as curriculum differences need to be taken into account when comparing schools, so too cultural preferences impact on possibilities.

1. **Teacher Learning**
   
   Teacher development and quality are key pointers to school effectiveness (Hattie 2009), with teacher quality recognized as crucial to school learning improvement (McKinsey 2010, Hattie, 2009). As Senge (1990) pointed out, “as the world becomes more inter-connected organizations that will truly excel in the future will be (those)... that discover how to tap people’s commitment and capacity to learn.”

   CDNIS’s curriculum offerings are supported by digital learning opportunities for all, at hand support, and a Digital Literacy Certificate is under development.

2. **Valuing Digital Learning**
   
   Value judgements play an important part in ongoing dialogues. For example, the educational value of Project Based Learning (PBL) provides a good example as differing value judgements (Hattie 2010, Apple 2012, Voogt et al 2011).

   A Learning Technologies Committee (LTC) was formed at CDNIS to bring together stakeholders from across the school community, including parents; to discuss, to debate, and to arrive at shared understandings.

   Project Days have also been supported by the school; where mini-projects are undertaken by all Middle School students to build digital literacy and design thinking as part of inter-subject approaches.

3. **Assessment**
   
   As discussed previously, a narrow view of digital learning is one where use of digital technologies is constrained to measurable test scores. To widen this requires a widening of assessment values.

   At CDNIS student iFolios are created and managed by Middle School students to support their subject and personal learning. Peer support and technical skill development are key drivers, with the personal iFolio providing assessable media creations. Reporting avenues for student constructed work are being explored.

4. **Leadership**
   
   Finally leadership is critical. As Fullan (2011) reminds us
   
   “the right drivers - capacity building, group work, instruction, and systemic systems - are effective because they work directly on changing the culture of school systems, values, norms, skills, practices, relationships; by contrast the wrong drivers alter structure, procedures and other formal attributes of the system without reaching the internal substance of reform - and that is why they fail.”

   The LTC, in conjunction with the school leadership structures, oversees a digital infusion plan, provides reviews and coordinates support and resourcing.

The importance of balancing all this within the cultural opportunities and constraints of a particular school, while catering for diversity of aptitude and attitude, is messy. But to fall back on superficial advocacy sells everyone short. Essential Conditions for an effective approach need to include diversity and acknowledgement of value judgments as part of the ongoing dialogue in changing times.
Practical Steps

As part of the teacher professional learning approach at CDNIS a Digital Literacy Certification is being developed. This will include:

1. **CDNISu**
   - Using online videos (such as TED talks) to bring teachers up-to-date with issues affecting their use of digital technologies in school, particularly to consider pedagogy and learning values.

2. **Teacher Digital Skills**
   - To ensure teachers have what is accepted as basic digital tools for effective teaching within the school.

3. **Digital Literacy**
   - Evaluating the level of Digital Literacy (adaptability, connection, cognitive development, problem-solving, practical applicability) to provide feedback and support for effective classroom use of digital technologies.

4. **Classroom Evidence**
   - Collecting evidence of practical applications to confirm use of digital literacy attributes to support high standards of teaching and learning. Opening up channels for sharing and risk-taking.

5. **Issues**
   - Active involvement in issues affecting the school as a learning community, from Digital Citizenship to Global Connections to Informal Learning, and a whole lot in-between.

Using the Gillen and Barton (2010) framework, not only can we see where digital literacy certification can contribute, but also which areas need further work.

### Student

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<tr>
<td>Role of ICT in PYP</td>
<td>IB MYP AOI</td>
<td>MYP Design Thinking</td>
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<td>Collaboration problem solving</td>
<td>Flattened pedagogy</td>
<td>Media Lab 707 Media Power</td>
<td>Digital Ambassadors</td>
<td>LT Guidelines</td>
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<td>Authenticity and access</td>
<td>iFolios (MYP, DP)</td>
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<td>LT Guidelines</td>
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### Teacher

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<td>LTT access</td>
<td>Parent portal access</td>
<td>personal laptop LTT open-door</td>
<td>CISPA sessions Social Media strategy</td>
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**Fig. 4 One school’s analysis**

**A Final Point**

I could have written this twenty years ago and many of the discussion points would be as relevant and debatable as they are today. But the ongoing nature of discourse means this remains a fresh yet ongoing discussion. What happens in any particular school or school system is a cultural question. But Digital Literacy provides an avenue...
to build on the digital learning that at times has been haphazardly addressed in schools. Embedding Digital Literacy is a dynamic, required undertaking (Voogt et al 2011).

As Stanford Education Professor Emeritus Larry Cuban (http://larrycuban.wordpress.com/) notes, schools have only changed for the better where teachers chose to embrace technology and schools have chosen to adapt within existing requirements (2012). He is right within the constraints of contemporary traditional school values. If Digital Literacy matters for school it not only needs to be seen to matter, but also supported and strongly linked to school learning that endures and grows.

References


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