



By ZdenekBuchsbbaum

so you think they can learn?

Teachers are passionate people, committed to providing students with rich learning experiences and diverse opportunities to help them rise to the challenges that our world provides.

The 21st century conception of learning is about much more than simply adopting new skills and integrating them into the curriculum, or purchasing new technologies and placing them in classrooms. It is the fundamental shift from a teacher centred learning environment to a student centred one (Zmuda, 2009).

Most teachers want to learn [how to prepare students to succeed in the 21st century](#) (Figure 1) because this century is unlike any other for the rapid pace of change being driven by technology.



Judy O'Connell, Lecturer in Library and Information Management, Faculty of Education, Charles Sturt University, Australia, urges *Scan* readers to make learning visible by re-envisioning information literacy for today's learners.



@heyjudeonline

Influence of emerging technologies

A summary and predictor of the influence of emerging technologies has been the international Horizon Report K-12 edition, issued annually since 2009. The [2011 report](#) highlights the key technology trends that are currently affecting the practice of teaching, learning, and creativity. The following five trends have been identified as key drivers of technology adoptions for the period of 2011 to 2016.

1. The abundance of resources and relationships made easily accessible via the internet is increasingly challenging us to revisit our roles as educators.
2. As IT support becomes more and more decentralised, the technologies we use are increasingly based not on school servers, but in the cloud.
3. Technology continues to profoundly affect the way we work, collaborate, communicate and succeed.
4. People expect to be able to work, learn, and study whenever and wherever they want to.
5. The perceived value of innovation and creativity is increasing.



Figure 1. *I have a question. Why 21st century learning?*

These critical challenges are already impacting on the planning and delivery of learning and teaching, and influencing the way students connect, communicate and collaborate as they learn. Equipping every learner for the 21st century involves skills, pedagogy and technology, with collaboration and creativity being emblematic of the paradigm shift underpinning these changes (CISCO, 2008). The information environment is a technology environment which demands adaptation. As information is also a networked resource, engaging with information becomes a cultural and social process of engaging with the constantly changing world around us (Thomas & Brown, 2011, p.47).

As Leadbeater (2010, p. 27) explains,

The net is still evolving and so too are the metaphors we deploy to make sense of it. One thing is clear: as the net develops it will connect more people, devices, data and programs more densely and intensively. The scale and diversity of these connections will drive us towards a qualitatively different kind of internet.

It is clear that we cannot know exactly how technology will continue to drive the changes

that are impacting on the learning experiences of students. [A day made of glass](#) is an exciting peek into that future. We knew the shift was here to stay when [@YouTube](#) tweeted its milestone of 60 hours of video uploaded every minute and four billion video views a day (Figure 2).



Figure 2. [@YouTube milestone](#)

Information deluge

[The 2011 Digital Universe Study: extracting value from chaos](#) (IDC, 2011) confirms the digital growth, complexity and diversity of information sources, explaining that the challenge is to know how to tame the chaos and extract value. [Imagining the internet](#) provides a history and a forecast from combined experts and voxpop voices in tracking and predicting change.

Because of technology, students expect to find information online quickly and easily! Yet these same students are often novices when it comes to searching for and finding information. As teachers, we know that the empowered learner calls upon information inquiry skills: to connect what he or she knows; to ask intriguing questions about what is not known; to investigate the answers; and then to construct new understandings to share with others.

Being able to research well is a key component to any kind of learning. Yet without being taught

how to be *critical and perceptive* in information environments, those doing the *looking* simply will not have the sophisticated skills or understandings needed to navigate complex information environments, then filter and evaluate the information they do happen to find.

Mismatch in our minds

The saying goes that *seeing is believing*. The story of [The invisible gorilla](#) shows us how our intuitions actually let us down. Can people really miss a gorilla right in front of their eyes? This research based twist on *seeing the wood for the trees* (an expression often used in relation to information seeking) highlights why we need strategies in place to deal with the mismatch between what we see and what we think we see (Figure 3). The audio and visual inputs from digital media need *gorilla capacity* filters. It is very easy to think you have the answer, when, in fact, you simply did not have the right question or the right search strategy!



Figure 3. Screenshot from [The invisible gorilla](#)

Howard Rheingold maps an approach to [Mindful infotention](#), a combination of learned attention skills and online information tools. These skills are, perhaps, an important part of the toolkit that

students need to find, filter, focus and formulate ideas in order to be able to absorb information and create new knowledge. Our students need this combination of attention skills, curiosity and technology to be well-equipped to make useful connections with the real information world of today and the future. See Rheingold's [short course](#) on infotention for more information about assisting students to manage information overload.

The digital learner

What skills and approaches do you think they need to learn?

Different people, when presented with exactly the same information in exactly the same way, will learn different things. So, while content is critical, even more critical is allowing students to express their curiosity and questing disposition.

For this, [ISTE's NETS for Students \(NETS•S\)](#) provides *standards for evaluating the skills and knowledge students need to learn effectively and live productively in an increasingly global and digital world.*

They are grouped as:

- Creativity and Innovation
- Communication and Collaboration
- Research and Information
- Critical Thinking
- Digital Citizenship
- Technology Operations.

Managing information seeking and information use within these standards is central to the information literate school community. Teachers encourage a combination of tools and skills to find, remix, create and produce both scholarly and creative

responses to the challenges we provide. We must also encourage and build the capacity of students to engage with content in the most effective way.

The [General capabilities](#) detailed in the Australian Curriculum also address this mix of tools, skills and knowledge across curriculum content in each learning area. The Australian Curriculum includes seven general capabilities (Figure 4):

- [Literacy](#)
- [Numeracy](#)
- [Information and communication technology \(ICT\) capability](#)
- [Critical and creative thinking](#)
- [Personal and social capability](#)
- [Ethical behaviour](#)
- [Intercultural understanding](#).



Figure 4. [General capabilities in the Australian Curriculum](#)
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Students need to develop and apply these interconnected skills, understandings and behaviours in their learning. (Figure 4).

[Editor's note: New syllabuses to be provided by Board of Studies NSW will take account of the General capabilities and cross-curriculum priorities.]

Working in online environments involves skills and processes that are common to print literacy as well as skills that are unique, such as using search engines, reading websites, selecting appropriate hyperlinks, and comparing information across resources (Doiron, 2008). We are nurturing informed learning (Bruce, Hughes & Somerville, 2011) by re-focusing attention on using information to learn, while also supporting the development of the learners' growing awareness of their information use experiences as they go about learning. Yet, according to Herring (2011), popular assumptions about the success of information literacy knowledge and skills transfer are inaccurate, leading to problems in instruction.

Information fluency

So what is the problem? Perhaps the answer is that *infowhelm* is best approached with information fluency. The core purpose of information literacy needs has evolved. The 21st Century Fluency Project (21CFP – the fluencies, n.d.) identifies critical thinking skills as essential to living in a multimedia world, and introduces [information fluency](#) as a term (concept) to describe the ability to subconsciously and intuitively interpret information in all forms and formats in order to extract the essential knowledge, authenticate it, and perceive its significance (Figure 5).



Figure 5. *InfoWhelm and information fluency*

We have an information *Renaissance* that is rewriting the world of *The 21st century learner* (Figure 6) through:

- knowledge
- information bias
- distributed social and personal information
- public and private data
- global marketing
- clashing cultures
- a million voices commenting on a billion issues in blogs, wikis and podcasts.



Figure 6. *The 21st century learner*

Information technology has become a participatory medium, giving rise to an environment that is constantly being changed and reshaped by the participation itself, changing the flow of news, effecting tacit as well as explicit knowledge, and embedding a new culture of learning (Thomas & Brown, 2011).

It is in this [r]evolutionary environment that a 21st century teacher librarian can take a leading role in developing information literacy through a *culture of enquiry*. As Gordon, (2010, p. 79) explains, a culture of inquiry emerges as *teachers become learners, and learners are self- and peer-taught, and everyone becomes a researcher*.

Building capacity through information literacy

Teaching and learning in school libraries has been shifting from tool based and skills based instruction to constructivist user and learner centric approaches, and evidence based practice has become the essential tool for improvement of practice (Bates, McClure, & Spinks, 2010; Gordon, 2010).

Joyce Valenza articulated these changes in her *See Sally research* presentation (Figure 7) for TEDxPhiladelphiaED (2011). The new search modalities she talks about require a more sophisticated response from information literacy programs. Educators need to teach the necessity of actual evaluation of every information source, even those traditionally considered reliable, because of the interconnectedness of information sources and socially networked tagged repositories (Gunnels & Sisson, 2009).



Figure 7. *See Sally research*

Hay and Foley (2009) expand on the importance of *building capacity* for 21st century learning and highlight the vital importance of establishing comprehensive resource based learning programs that are mindful of the current and future pace of technology change. There are very specific dimensions to such programs that the expertise of a teacher librarian can enhance.

Inquiry remains the foundation of learning ...

Simply using the latest 1-to-1 device, or the latest website, or the latest app is not the solution, although these shiny new toys can provide an illusion of advancement and success. Inquiry remains the foundation of learning, and it is the teacher librarian who can provide the broad knowledge of the extensive resources in the physical and virtual library, on the internet and in the community. Without this expertise, teachers can only minimally accomplish the information literacy requirement of 21st century learning standards (Kuhlthau, 2010).

Guided Inquiry, as an instructional framework, supports students' information-to-knowledge journey. Guided Inquiry offers

... an integrated unit of inquiry planned and guided by an instructional team of a school librarian and teachers, together allowing students to gain deeper understandings of subject area curriculum content and information literacy concepts.

Kuhlthau, Caspari, & Maniotes, 2007, p. 1

In recent years, *Scan* has featured articles that focus on the teaching roles of Australian teacher librarians who are committed to making student learning visible (Fitzgerald, 2011; McLean, 2011; Scheffers, 2008; Sheerman, 2011; & Sheerman, Little & Breward, 2011).

The common thread in each article is the importance of evidence based practice, which includes assessment and reflection on student learning using Guided Inquiry as an instructional framework. Teacher and student comments, reflection sheets, collaborative wiki spaces, peer review, surveys and critical feedback are prime components of the learning and teaching, featured in these articles, and answer the question posed by this author: *So you think they can learn?* with a resounding, *Yes we do, and we have the evidence.*

Pedagogy of digital participation

The interactive nature of social tools on the web has produced related actions of *participatory organisation, sourcing, corroboration, connected meaning, deep reading, media literacy and ethical participation* (Stripling, 2010). The difference today is the fact that technology allows immediacy,

personalisation and collaboration in information seeking and knowledge conversations that were never before possible.

In a world of Facebook, Edmodo and Animoto, learning dimensions have changed (see *Spartan Guides New tools* and *Research tools* as examples). Not only does technology provide students and teachers with creative, organisational thinking tools, it also makes it possible to harness online environments to collaborate easily and build understanding together (Figure 8).

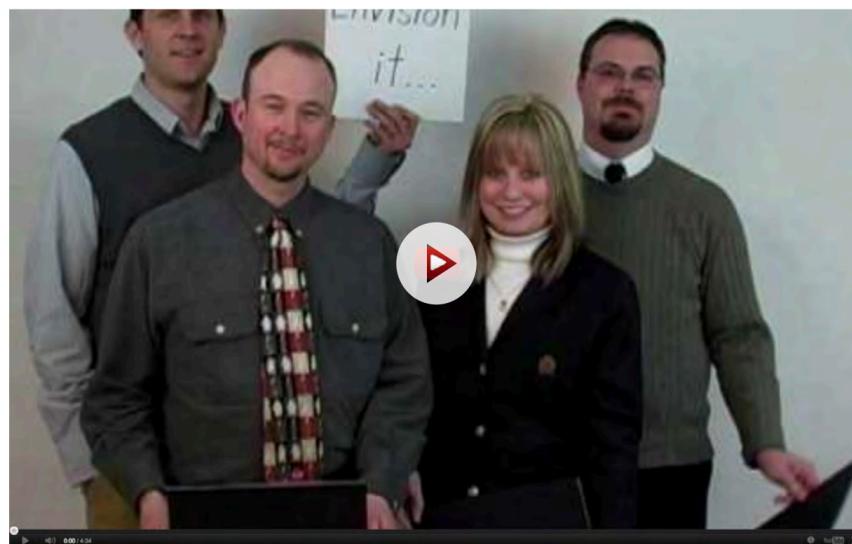


Figure 8. *A vision of 21st century teachers*

It can be much easier to monitor progress and evaluate learning. This is the power of participation - a collaboration that refines thinking, allows excitement and challenge, and leverages creativity and innovation. When online gamers topped scientists' efforts to improve a model enzyme using the online game *Foldit* (University of Washington in Seattle) [a milestone in crowd-sourced research](#) was achieved.

What we are seeing here is a significant expansion in the ways that information literacy can be understood and applied. In any information literacy model, learners naturally discover new questions and intriguing areas to pursue for future investigation, regardless of the environment. Educators need to be aware that the characteristics of the digital environment drive the new skills and strategies that students must develop to become effective 21st century learners (Stripling, 2010).

... technology...makes it possible to harness online environments to collaborate easily and build understanding together.

The world's knowledge is delivered in a variety of formats, so educators need to recognise that since all media are relevant, students need to be familiar with information literacy in all its dimensions (Bush, 2009).

In a participatory, socially connected learning world, models of information literacy need to include concepts that are described by Stripling (2010), including:

- **relational search strategies** - understanding that information is retrieved through links and lateral connections on the web
- **participatory organisation** - knowing how to share to capitalise and build information in group activities and by tagging
- **sourcing and corroborating** - understanding authority in the open web/open source environments

- **connected meaning** – developing capacity for connecting meaning between texts, through links and sites to the big idea
- **patterns and relationships among ideas** – using online organisational tools to facilitate the thinking process
- **deep reading** – developing capacity to move beyond superficial web environments, avoiding the graphic seduction of visual and aural materials
- **ethical participation** – understanding mashup of information and creative commons.

Information literacy for the 21st century is a meta-literacy of information flow through fast information transactions and social channels of engagement. It is a recursive action that translates core information literacy skills into a pedagogy of digital participation.

Bush (2009) also explains:

The task of knowledge gathering used to revolve around answering the question; today, the task is questioning the answer.

Information transliteracy in the 21st century classroom

Social content curation

In this new information literacy environment, social media has powered content curation for organising, filtering and making sense of information on the web, and then sharing the very best pieces of content with an extended network. Social content curation is about collecting, organising and sharing information, in a new package, and in a new information literate way. Look at [Pinterest](#), or

[Scoop.it!](#), or watch students at work in [Edmodo](#), taking notes with [Evernote](#), collaborating with [Diigo](#), or making [iMovies](#) on the iPad, and the connected dimensions of 21st century information literacy are so clearly and deeply extended from what was happening a decade before.

Make learning visible

While the technologies continue to change, and the resulting approaches to learning curriculum presents new challenges, the cognitive and metacognitive transactions that underpin information literacy in a digital era will remain a constant. By the same token, information literacy for 21st century learning can make learning visible in so many new and challenging ways - but only when we take the time to understand the new dimensions of information literacy by becoming active participants in the fast-changing networked world.

... information literacy for 21st century learning can make learning visible in so many new and challenging ways ...

So you think they can learn?

Only if you embrace an information literacy paradigm that hinges on their future, not on your past.

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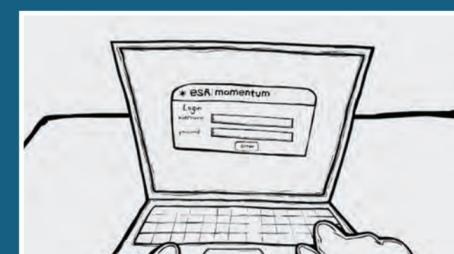
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