



Future learning and school libraries

All young Australians will become successful learners,
confident and creative individuals, and
active and informed citizens
(MCEETYA, 2008, p.8).

EXECUTIVE SUMMARY

Australian school students are immersed in a rapidly changing world. Their learning experiences and outcomes are influenced by an array of international and national trends. As stated above, in the cited second goal of the *Melbourne Declaration* (MCEETYA, 2008, p.8), they need an education that will enable them to become successful learners and informed citizens. The *Australia in the Asian century* white paper clearly states the need to invest in skills development to ensure all Australians can participate in and contribute to Australia's productivity and future (Australian Government, 2012). It is imperative for the growth and well-being of Australia that educational policy and school leadership respond constructively to these trends.

Teacher librarians and school libraries have a pivotal role to play in 21st century education and this paper presents an overview of:

- International and national trends that impact on all aspects of education
- The impact of digital technologies and the role of teacher librarians in the implementation of digital literacy
- The changing learning environment and how school libraries can support student learning
- The role teacher librarians can play within an education that builds capacity for student and staff learning.

INTRODUCTION

This paper is an information base to support decision making for future focused learning in Australian school libraries. It seeks to enhance understanding about the implications of international trends for Australian schooling, the need for rigorous evaluation and the contribution that school libraries and teacher librarians can make to student learning.

The paper is in four parts.

- The first part sets the scene by reviewing the wider environment in which 21st century learners and educators are immersed. It outlines key trends affecting contemporary F–12 schooling, with a particular focus on globalisation, technological advances, changing workforce needs, and the Australian context.
- The second part considers educational implications of these trends for the future of learning. It addresses particular challenges of the changing learning landscape, and ways for building learning adaptability and capacity.
- The third part discusses means of evaluating education outcomes, through quantitative analytics and evidence based practice.
- Finally, the paper presents a call to action for key education authorities in Australia.

CHANGING EDUCATIONAL ENVIRONMENT

Educators and policy makers in Australia are operating in a rapidly changing environment. In considering the needs of 21st century learners in Australia, it is essential to first consider global trends and their impacts on educational and workforce conditions.

Globalisation

Globalisation is a phenomenon that has caused major economic shifts within and between countries. Over the next 20 years the so-called BRIC economies of Brazil, Russia, India and China are forecast to be the new global leaders (Redecker et al, 2011, p.25). Indonesia is also emerging as a growth economy with a growing consumer class and an emerging digital and technology-driven nation (Oberman et al, 2012). These emerging economies will change the balance of power and challenge the prosperity of current developed nations, including Australia.

Key alerts

Globalisation facilitates connectivity across schools to allow for collaborative engagement in the exchange of information and creation of new knowledge for students.

The teacher librarian and the school library are vital agencies in facilitating global connectivity. Teacher librarians are instrumental in

- the design and delivery of digital literacy programs,
- adopting digital citizenship approaches to exercising social responsibility and ethical practice, and
- creating awareness of cultural sensitivity in a digital environment.

They also identify, store and disseminate relevant and appropriate information to support the teaching and learning process; Teacher Librarians assess the quality of information and customise access to that information.

The continuing effects of globalisation are having a significant impact on all aspects of our society. In particular, globalisation is driven by ever advancing technologies which inevitably bring about the growth of new industries (and the demise of others), new work practices and different employment patterns.

Globalisation is blurring temporal and geographical boundaries. Knowledge and information exchange occurs constantly, allowing businesses and industries to be always connected. Employers and work colleagues are increasingly dispersed, due to flexible work schedules and places. Many companies have multinational bases for their sales and technical support services; outsourcing of production has become common.

Key alerts

Rapid technology innovation impacts schools through not only new devices and applications in the market but also decisions on how the innovation can be used for learning. Schools therefore need to facilitate curriculum development and resourcing so that teachers can use innovative technologies for student learning.

School libraries are 'flexible, dynamic, high tech 21C learning centres' (Hay & Todd, 2010) that are the hub of the learning environment of a school. The realisation of this potential is based on the expertise and flexibility of the teacher librarian, who works to:

- identify and embed web tools and applications into curriculum programs,
- facilitate student collaborative learning in an innovative environment, and
- provide different learning environments for innovation and creativity.

With continued economic growth of developing countries like China, India and Indonesia, it is likely that product and market demands will shift and global organisations will change and evolve to remain competitive (Davies et al, 2011, Oberman et al, 2012). As new technologies facilitate increased connectedness, crowdsourcing tasks will become common practice with a greater emphasis on virtual distribution and online collaboration. The tasks or problems can be outsourced to a multitude of people, not specifically the employees of an organisation, who collectively contribute to a new production model and a distributed problem-solving process.

Technological trends

Technological innovation will be a major influence on the future job market. Technology continues to develop at an exponential rate, impacting on the ways we work, communicate, collaborate and socialise. Increased computing power and miniaturisation of devices, accompanied by decreasing costs, provide opportunities for higher levels of accessibility and availability across society. The shift from networked to ubiquitous computing has been accompanied by the portability of devices with multifunctional capabilities. Cloud based applications and services allow global connectivity, where materials are

transferred from analogue to digital environments. Ultimately, this trend increases the availability of access to data, information and knowledge for everyone, including students and teachers.

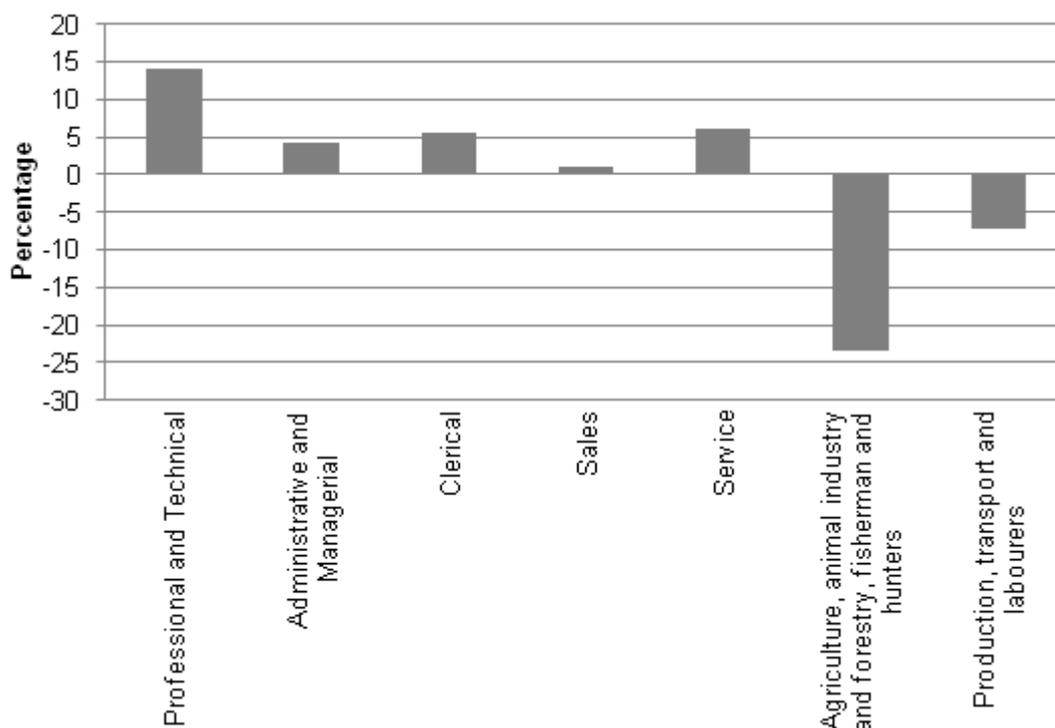
Social media platforms provide a way for groups of people to connect and collaborate on a multitude of tasks and issues. Within these environments anyone can be an author, creator or

collaborator. The incessant flow of information has generated challenges which are popularly referred to as ‘information overload’, ‘information pollution’, ‘infowhelm’, ‘information explosion’, ‘TMI’ (too much information) and ‘info:noise ratio’. This environment creates a paradigm shift with regard to the nature of information and its uses. Traditionally, information professionals adopted a gatekeeper role and applied standards to ensure users’ access to *quality* information. Now, students are encouraged to source their own information by approaching ‘content with more scepticism and the realization that what you see today may be different tomorrow’ (Davies et al, 2011, p.4).

Workforce trends

The nature of work and patterns of employment are also subject to ongoing change, as shown by Figure 1 below, which shows trends across OECD countries over the last half century (OECD, 2012, p.20).

Figure 1. Changes in employment shares by occupational groups, 1960–2009, selected OECD countries



1. Australia, Austria, Belgium, Canada, Chile, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Japan, Korea, Luxembourg, Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom and United States.

Between the 1960s and 2009, jobs identified in Organisation for Economic Co-operation and Development (OECD) countries have shifted from the farm to the factory floor to the professional office. These changes indicate a trend: highly skilled workers are needed for technology related jobs and low skilled workers for services that cannot be automated or digitised. However, mid-level skills have largely been replaced by robotics. The combined forces of increasing globalisation,

an information and communications revolution and the pace of technological change have contributed to the growth of the knowledge economy (Powell & Snellman, 2004). A knowledge economy is characterised by the role of knowledge as a factor of production; the codification and commodification of information and subsequent dissemination and distribution through networks at minimal cost.

The shift from a resource-based economy to a knowledge-based economy not only impacts on the types of jobs available, but also the work skills that people need to secure employment. A hybrid skill set—such as technology, business, interpersonal and information seeking skills—is becoming essential (Redecker et al, 2011). According to the OECD (2012, p.10): ‘Skills have become the global currency of 21st century economies’. In this context, skills are defined as the combination of knowledge, attributes and competencies that can be learned and that allow an individual to successfully perform a task. These skills can be built upon through continuous learning. The sum of the skills available to any given economy forms the human capital of the country.

Given this focus on skills for a productive workforce, there is a need for government policies to develop ‘human capital, the development and nurturing of an entrepreneurial climate, and the promotion of broad access to skills and competencies—especially the capability to learn’ (Houghton & Sheehan, 2000, p.21). This will require a commitment to formal education, as well as incentives for companies and individuals to undertake ongoing training and lifelong learning. Rather than creating narrowly skilled experts, educational institutions will need to ensure people have ‘broad-based problem solving skills and social and interpersonal communication skills required for teamwork, along with the skills and attributes required for flexibility’ (Houghton & Sheehan, 2000, p.21).

Educational trends

Globalisation and technological advances also affect the ways in which education is provided. The curriculum needs to ensure that students develop attributes and skills

Key alerts

The findings of research studies conducted in Australia and overseas demonstrate the contribution that teacher librarians and school libraries make to students’ learning and literacy e.g. Combes, 2008; Hay, 2005, 2006; Lonsdale, 2003; Lankes, 2012; Smalley, 2004; Todd & Kuhlthau, 2005. The varied roles and contributions of teacher librarians to their school communities are illustrated in the almost 400 submissions to the Commonwealth Government’s inquiry into school libraries and teacher librarians (House of Representatives, 2010). The Inquiry was significant and timely in the context of Australian government financial investment in the building and refurbishment of school libraries through the Building the Education Revolution program. Its recommendations recognise that school libraries are important sites of student learning, which warrant resourcing and professional staffing.

necessary for a rapidly changing society and workplace. Already, digital technologies are enabling innovative pedagogy and connected learning. Students are no longer limited to learning materials available within the confines of their school, but are able to draw on almost boundless resources of multiple types via the internet. They have become connected learners (Siemens, 2004) who can explore, share and create knowledge with peers in their own classroom and around the world.

Key alerts

In order to create classrooms where learners are connected and can share their knowledge, teacher librarians support teachers in developing digital literacy capabilities. The Horizon Report 2012 K-12 (Johnson et al, p. 9, 2012) recognised that pre-service education for teachers does not adequately provide the skills and techniques needed as a critical component for essential digital literacy's in teaching and learning.

The Australian Charter for the Professional Learning of Teachers and School Leaders together with the Australian Performance and Development Framework outlines the professional learning rationale and processes schools should provide to develop teachers' performance.

Schools will need to implement a professional learning and performance process. Teacher librarians, as highly accomplished personnel, can assist in this process as they work collaboratively with colleagues to improve teaching practices. They engage in discussions about:

- Effective teaching and learning strategies
- Relevant and appropriate resources
- Integration of digital technologies

They apply their knowledge and skills to:

- Mentor and guide teachers
- Demonstrate innovative teaching and learning practices.

The impact of principal autonomy has resulted in the deployment of teacher librarians to roles within the school that underutilise the knowledge, expertise and skills of these highly qualified and experienced teacher librarians.

The nature of educational providers is also changing. It has been suggested (Redecker et al, 2011) that responsibility for the provision of individual education could move from the state to the individual and family groups. Early years' education will probably remain a state concern, but the influence of the private sector on curriculum and policy is likely to increase. There is a general trend towards flexible and online education in the education sector due to the accessibility of digital learning resources and online courses. In addition to traditional schools and institutions,

virtual academies are emerging, which offer online home schooling (for example, California Virtual Academies, 2012).

Key alerts

Teacher librarians support the 21st century learning goals of the Australian Curriculum through well-developed knowledge of curriculum and pedagogy, as well as information expertise to 'support and implement the vision of their school communities through advocating and building effective library and information services and programs that contribute to the development of lifelong learners' (ASLA/ALIA, 2004).

As educators, they provide the required intellectual agency for developing students' deep knowledge and understanding through multi-modal investigation and experimentation with information. They enable students to examine this information through multiple perspectives in a learning environment where students are guided and given appropriate instruction to effectively utilise the best technology tools to support their achievement (Hay & Todd, 2010).

Australian context

In addition to these global trends, education in Australia is affected by national and state government education policy. Current national drivers include the Australian curriculum (ACARA), quality teaching, professional learning charter, performance and development, education reform and principal autonomy in school-based management. These initiatives all have an impact on the learning experience and outcomes of students and the professional practice of teachers.

The impact of government initiatives on staffing and resourcing of school libraries is evident in the findings from the 2012 Softlink Australian School Library Survey (Softlink, 2012) which include:

- There is a positive relationship between well-resourced libraries and higher student literacy outcomes
- The majority of school libraries had no change in budgets in the past 12 months
- Very few school libraries received additional resources for implementing the Australian Curriculum
- Staffing levels remained unchanged for the majority of school libraries during the past 12 months
- Challenges continue to be: gaining funding, finding a balance between the physical and digital collection, collaboration with teaching staff and the recognition of teacher librarian's skills and their evolving role.

IMPLICATIONS FOR 21ST CENTURY EDUCATION

The changing learning landscape

From the previous section, it is evident that ‘the current learning landscape is constantly changing in terms of what is learned, the context in which learning takes place, and who is learning’ (Paas, 2011, p.2). In this ever changing landscape, the learner is central; this requires curriculum and pedagogy that address the following aspects.

- Evolving needs of learners.
- Developing knowledge building environments.
- Focusing on personalisation.
- Evolving spaces for learning.
- Evolving learning devices or hardware.
- Evolving pedagogy.

Each of these aspects is discussed below.

Evolving needs of learners

In the traditional education mode, students concentrated on gaining knowledge of a discipline or subject. However, in the contemporary environment, students are required to not only build their knowledge, but also to develop advanced capabilities for critical thinking, collaboration, problem solving, as well as the traditional literacies.

Twenty-first century learning involves active engagement with the process as well as the content. It involves inquiry, independent effort and shared discovery, using a wide variety of information types and media. Students become informed learners (Bruce, 2010) by simultaneously learning about a topic whilst also learning how to use information critically, ethically and creatively.

Students must gain not only the skills but also the disposition to use those skills, along with an understanding of their own responsibilities and self-assessment strategies. ...They are expected to provide a broad range of products of learning to showcase their knowledge and understanding, whilst becoming self-directed, self-evaluated and self-reliant. Consequently, they need constant access to information, tools for learning and support for learning, whether this is provided by teachers or others through social media and other networks. In this way they blur the boundaries between learning at school and learning anywhere (AASL, 2007, p.2).

Research shows that the greatest key to student improvement is quality teaching (Hattie, 2003). Hattie indicates that ‘excellence in teaching is the single most powerful influence on achievement’ and identifies major influences as:

- feedback

- instructional quality
- direct instruction
- classroom environment
- challenge of goals
- peer tutoring
- mastery of learning
- homework
- teacher style.

Quality teaching demands continued reflection, development and evaluation on the processes of teaching and, therefore, support at the school level.

Developing knowledge building environments

To enable 21st century learners to cross learning boundaries, educators need to provide knowledge building environments, both physical and virtual, to enhance collaboration and

Key alerts

Teacher librarians' knowledge and use of current and emerging digital technologies, together with a deep appreciation of literature, can transform teaching and learning within the school.

Teacher librarians, as highly accomplished educators:

- contribute to their colleagues learning through mentoring, coaching, and modelling sound teaching practices,
- initiate ideas, strategies and discussions about effective teaching to improve educational outcomes for students,
- teach, collaborate, listen, advocate, innovate, create, share with students and staff,
- model and build capacity for lifelong learning, and
- demonstrate leadership capabilities.

creativity (Scardamalia et al, 2012). Such environments promote knowledge work in a communal space where others can criticise or contribute to ideas. 'In these collaborative open contexts, discourse that is democratic and directed toward idea advancement compounds the value of ideas, so that collective achievement exceeds individual contributions' (Scardamalia et al, 2012, p.238).

Focusing on personalisation

As learners and their needs continue to evolve, the learning process and pathways need to become increasingly personalised. The one size fits all approach to learning no longer applies. Correspondingly, all learning activities and assessment need to be contextualised to enable authentic learning, whilst catering for learners' varying learning styles.

Evolving spaces for learning

The personalisation of learning also mandates that there is an increasing need for flexible and varied learning spaces. Howell (2008) recommends providing a variety of learning spaces that are both communal and social, with a mix of

individual and group spaces, where students can switch seamlessly by choice between spaces. It is important when designing learning spaces to consider all aspects that affect learning and how these relate to the students' perceptions of space and their learning needs.

Evolving learning devices or hardware

As evidenced by the Pew Internet Research Center report (2012) and the *Horizon Report* (Johnson et al, 2011, 2012), a digital ecology has emerged with the internet, smart phone and other mobile devices. Thus, digital literacies are integral to knowledge acquisition in an increasingly digital landscape, where its connectivity allows access to information anywhere and anytime. As the *Horizon Report K-12* (Johnson et al, 2012) emphasises, students need to develop digital literacies to use mobile devices for learning in all aspects of life.

Evolving pedagogy

A longitudinal research study of emerging technologies in K–12 education (Johnson et al, 2012) has been charting ongoing technology changes and highlighting the impacts and evolving needs in teaching, learning, and creative inquiry practices. Its findings highlight the responsibility of schools to prepare students to move from the world of school to the world of adulthood, employment, further education, vocational training, and community participation.

The evolution of mobile devices, the culture of *always being connected* and the increasing personalisation of learning is also having a profound effect on teaching. Engaging students individually requires a 1:1 approach to teaching and learning. Teachers are continuing to develop changing practices to meet the needs of learners, whilst equally supporting knowledge acquisition and learning processes. The recently formulated pedagogical construct of informed learning (Bruce, 2010) supports this simultaneous approach for 'using information to learn'.

New technologies and social media platforms are driving an

unprecedented reorganisation of the learning landscape in and beyond schools. These disruptive shifts are already reshaping the workforce and the skills required, (Davies et al, 2011), establishing lifelong and life-wide learning as the central paradigm for the future (Redecker et al, 2011, p.10). There is a need for schools to develop a sustainable and responsive technology-rich learning ecology that has adaptability at its core to support 21st century learning needs. John Seely Brown (2000, p.18) describes the nature of a learning ecology as

Key alerts

Teacher librarians, as resource aggregators:

- maintain an inviting and innovative physical and virtual collection that supports and involves learners in both their educational and personal development, and
- understand the current and emerging media formats and the importance of providing a range of resources to facilitate students' interaction and engagement.

...virtual communities of niche interests spread around the world as they interweave with local, face-to-face groups, in school or outside. A new, powerful fabric for learning starts to emerge, drawing strength from the local and the global. A cross-pollination of ideas happens as local students, participating in different virtual communities, carry ideas back and forth between those communities and their local ones. Now recall our emphasis that informal learning often involves the joint construction of understanding around a focal point of interest, and one begins to sense how these cross-linked interest groups, both real and virtual, form a rich ecology for learning.

The complexity of these new learning environments calls for a multifaceted pedagogical framework, such as the incorporation of the following.

- Ways of thinking: creativity, critical thinking, problem solving, decision making and learning.
- Ways of working: communication and collaboration.
- Tools for working: digital technologies and information literacy.
- Skills for living in the world: citizenship, life and career, and personal and social responsibility (ATC21s, 2012).

Key alerts

Teacher librarians, as literacy advocates:

- integrate multiple literacies into the curriculum through collaboration, planning, implementation and assessment of learning activities and programs, and
- create and manage programs that improve the learning environment to address higher-order thinking, deepen student knowledge of curriculum content and develop the learners' ability to access and use information in an ethical and responsible way.

Similarly, the Australian Curriculum (ACARA, 2011) includes seven interconnected general capabilities, namely:

- Literacy.
- Numeracy.
- Digital technology capability.
- Critical and creative thinking.
- Personal and social capability.
- Ethical behaviour.
- Intercultural understanding.

This multifaceted curriculum design supports sustainable learning, another imperative for 21st century education. Sustainable learning involves a pedagogic fusion between environments, tools,

formats and meta-literacy capabilities. For example, informed learning achieves sustainable learning by focusing attention on using information to learn. This also supports the development of the learners' growing awareness of their information use experiences (Bruce, Hughes & Somerville, 2011).

Interest-driven participation via social networking is also an important component of a sustainable learning ecology that fosters digital citizenship. For example, online interest-driven activities serve as a gateway to participation in significant aspects of civic and political life, including volunteering,

engagement in community problem solving, protest activities, and using a political voice (Kahne et al, 2011). A transparent framing of digital citizenship will support students in developing the personal skills and understanding to manage digital identity in online spaces.

The innovations in curricula and pedagogy mentioned above require a willingness to rethink enduring approaches to learning. Through a stronger focus on personalisation of learner needs and an approach to knowledge building, schools comply with a 21st century mandate to build a learning ecology that reflects a rich learning environment. A sustainable learning ecology that provides a lifelong and life-wide preparation for the future will place emphasis on

- developing critical thinking, problem solving and decision-making capabilities
- insight and analysis capabilities
- developing communication and collaboration capabilities
- integration of new-media literacy
- incorporation of complex information manipulation capabilities
- provision of equity in access
- building on authentic learning experiences
- supporting flexibility and adaptability across disciplines.

Building adaptability and capacity for learning

Given the changing learning landscape which young people inhabit, education must equip them with the skills to confidently and flexibly adapt and respond to change throughout their lives. An appropriate educational experience is underpinned and framed by constructivist principles including real contexts and authentic tasks, and is informed by concepts such as life-wide learning and lifelong learning.

Education in this changing landscape seeks to build individual learning capacity, since students are experiencing an increasing range of learning opportunities, formal and informal, in school and beyond. This blurs the boundaries between school

Key alerts

Teacher librarians as technology innovators:

- Provide equity of access to a range of digital resources and technologies.
- Demonstrate expertise in using technologies for information creation, storage, retrieval, dissemination, organisation and communication.
- Respect and adhere to guidelines and laws for intellectual property and fair use of information in a school setting.
- Model the attributes of a responsible digital citizen.
- Support teacher colleagues in exploring creative and innovative ways to use technologies to develop new ways of teaching and learning, and
- Use technologies to support problem solving and creative thinking by encouraging colleagues to set assignments that advance students' skills in using technologies to access information and to create and design products that demonstrate the students' understanding of the content.

and beyond, real and virtual. For example, social media being a part of learning and social practice (O'Connell & Groom, 2010, p.14) involves all of the general capabilities of the Australian Curriculum (ACARA, 2011).

In order to successfully navigate this dynamic learning environment, students need a range of well-developed literacies, including digital literacy. While understandings about *literacy* and associated concepts vary, in the context of this paper, digital literacy is understood to comprise ICT literacy, information literacy, and critical literacy (Wall and Ryan, 2010) and to integrate 21st century skills.

Twenty-first century skills, and the learning experiences that support their development, are essential starting points for capacity building. For example, Davies, Fidler and Gorbis (2011) identify 10 skills for the future workforce that focus on the uniqueness of human intelligence, as compared with computing capabilities of smart machines. These skills are as follows:

1. Sense-making: ability to determine the deeper meaning or significance of what is being expressed.
2. Social intelligence: ability to connect to others in a deep and direct way, to sense and stimulate reactions and desired interactions.
3. Novel and adaptive thinking: proficiency at thinking and coming up with solutions and responses beyond that which is rote or rule-based.
4. Cross-cultural competency: ability to operate in different cultural settings.
5. Computational thinking: ability to translate vast amounts of data into abstract concepts and understand database reasoning.
6. New-media literacy: ability to critically assess and develop content that uses digital forms, and to leverage these media for persuasive communication.
7. Transdisciplinarity: literacy in and ability to understand concepts across multiple disciplines.
8. Design mindset: ability to represent and develop tasks and work processes for desired outcomes.
9. Cognitive load management: ability to discriminate and filter information for importance, and to understand how to maximise cognitive functioning using a variety of tools and techniques.
10. Virtual collaboration: ability to work productively, drive engagement, and demonstrate presence as a member of a virtual team.

The aim for learners in developing these skills is to flexibly develop their potential rather than accrue a fixed set of skills.

The variety of information types and media available to students, and the need for a variety of skills, has led to the development of new pedagogical approaches, such as inquiry learning.

Inquiry is an approach to learning whereby students find and use a variety of sources of information and ideas to increase their understanding of a problem, topic or issue....It espouses investigation, exploration, search, quest, research, pursuit and study (Kuhlthau et al, 2007, p.2).

Informed learning essentially requires teachers to develop teaching and learning sequences to:

- bring about new ways of experiencing and using information, and
- engage students with those information practices relevant to their discipline or profession.

Key alerts

Teacher librarians actively engage in leading and demonstrating the use and application of action research to secure data to inform decision making for the future development of the school learning community.

For teacher librarians, evidence based practice involves

- asking questions,
- sourcing and analysing data,
- appraising key findings
- recommending future actions, and
- utilising research evidence.

Application of evidence based practice supports the following examples:

- The school library adds value to the teaching and learning program of the school.
- School library programs improve student achievement and learning outcomes.
- Teacher librarians embrace new models for interacting with learners using 21st century technology.
- Teacher librarians deliver inclusive, whole school digital literacy programs

Inquiry learning is recognised to be the quintessential pedagogy for teacher librarians, since it fuses informed learning principles (Bruce, 2010) and a rich learning process.

EVALUATING EDUCATIONAL OUTCOMES

In the contemporary environment, rigorous evaluation of all aspects of educational provision is required. School leaders and individual teachers need to demonstrate compliance with varying levels of accountability, to governments, parents and the wider community. Increasingly, students' and teachers' performance is measured by standardised testing, as represented by PISA/OECD on an international scale, and by NAPLAN on a national scale. With diminishing budgets and calls for financial restraint, reasoned allocation of resources becomes ever more critical. In the F–12 school context, sound data and detailed evidence provide the essential basis for future planning and implementation. Thus, for educational policy makers and school leaders it becomes essential to use data and predictive models to provide resources in the areas where they will make the biggest difference. For teachers, it becomes essential to use evidence from a wide range of sources to inform practice and learning outcomes.

At the administrative level, learning analytics offer significant support for educational evaluation and planning (Johnson et al, 2012, 2011). While learning analytics are still at a relatively early stage of development, within a few years they are expected to have great impact on curriculum improvement, pedagogy and student outcomes. Learning analytics are akin to data mining and draw on contemporary computing power to interpret the wide range of data that institutions gather about students, including demographic data, attendance patterns, time spent and interactions in virtual learning environments (VLEs), assessment and testing (e.g. NAPLAN) results. The increasing use of VLEs will enable more data gathering at an individual level. Statistical evaluation of this rich data source for patterns, trends and exceptions could lead to the development of predictive models that identify students at risk, provide individual pathways and trigger specific interventions. In this way, judicious application of learning analytics could assist in transforming curriculum and tailoring education to individual students' needs

In the classroom, evidence based practice (EBP) underpins quality teaching (Todd, 2009). EBP is a continuous process involving strategic and reflective engagement by the teacher in classroom practice. To enable students to meet the learning outcomes prescribed by the Australian Curriculum, teachers need to be evidence based practitioners who use educational data effectively to inform their practice, improve the curriculum and ensure effective assessment. By gathering and analysing evidence relating to their professional context, they can evaluate and enhance their pedagogy, and demonstrate the achievement of students' learning outcomes.

CONCLUSION

This paper presents the case that a future focussed teacher librarian contributes to student learning through the school library in the following ways.

- Applies agility to address educational change and responsiveness to curriculum development.
- Promotes inquiry based pedagogy as the driving force and philosophical basis for teaching and learning practices in the school community.
- Provides 24/7 access to information, as well as curation and mediation of learning resources.
- Supports the inter-connectedness and inter-dependence of a variety of learning environments.
- Builds capacity for lifelong / life-wide learning.
- Adopts evidence-based practice to inform teaching and learning.
- Guides inquiry, understanding and creativity among learners.
- Enables digital citizenship.
- Engenders a critical, ethical, and reflective approach to using information to learn.
- Provides professional learning opportunities based on the needs of the school and teaching staff.

In other words, a teacher librarian, within a 21st century learning environment, is an instructional leader, curriculum designer, consultant, collaborator, mediator for students and staff to achieve best practice in learning.

To enable teacher librarians and school libraries to fulfil their potential in advancing 21st century learning, there is an urgent need for further research and funding to support future planning and provision of school libraries, as evidenced by the report *School libraries and teacher librarians in 21st century Australia* (House of Representatives, 2011). There is also a need for enhanced professional education and employment opportunities to ensure that all Australian students benefit from the professional knowledge, practice and commitment of a teacher librarian at their school.

This paper is an information base to support decision making for future focused learning in Australian school libraries. It has outlined key social, technological and employment trends that impact on educational planning and provision in a rapidly changing environment. Responding to these challenges, it has demonstrated the significant role that teacher librarians and school libraries can play in advancing future learning and successful outcomes for 21st century learners.

Australian School Library Association Inc.

“While the Government plays a leadership and support role in Australian schooling, responsibility for the day-to-day management of schools, including allocation of staff such as teacher librarians, rests with state and territory education authorities.”

Hon. Peter Garrett MP (November 2012)

SCHOOL LIBRARIES SUPPORTING FUTURE LEARNING

Traditionally the role of the teacher librarian has been perceived as being a gatekeeper of resources and custodian of information artefacts. With new and emerging technologies, the dynamics of how information is accessed and utilised has changed. This has subsequently resulted in the role change as articulated throughout this document in the key alerts.

As schools are pursuing a world class 21st century education, then state and territory governments, and other education authorities, need to address the role and function of school libraries and empower teacher librarians in this context.

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GLOSSARY

Crowdsourcing - A process that involves outsourcing tasks to a distributed group of people, usually unknown to the author, through social networks.

Info:noise ratio - Used informally to refer to the ratio of useful information to false or irrelevant information.

Information/media ecology - The theory of media ecology (McLuhan, 1964) proposes that technology exerts profound influences on society; media and communication processes affect human perception and understanding; communication technologies can be seen as cultural environments (Ridgeway, 2012).

Learning ecology – ‘The Web helps build a rich fabric that combines the small efforts of the many with the large efforts of the few. By enriching the diversity of available information and expertise, it enables the culture and sensibilities of a region to evolve. It increases the intellectual density of cross-linkages. It allows anyone to lurk and learn. Indeed its message is that learning can and should be happening everywhere—a learning ecology. All together, a new, self-catalytic system starts to emerge, reinforcing and extending the core competencies of a region’ (Brown, 2000).

Lifelong learning - An individual’s pursuit of knowledge for personal benefit and/or professional competency.

Life-wide learning - The development of skills outside the traditional, academic, scholarly learning environment. These skills are a sub-set of lifelong learning that address a holistic approach to personal development.

Metaliteracy - An overarching framework that integrates technologies and combines multiple literacy types.

Mobile device - A small, handheld computing device that enables connectivity via wireless technology or telecom carrier.

Virtual academies -Educational institutions that teach primarily through an online learning environment.