

Ten school benchmarks to build student information strategies

By Anne Whisken

Snapshot

This article discusses implications from the author's PhD research about ways that information literacy education (ILE) can become an explicit practice in secondary schools and in so doing overcome the historic gap between its theory and practice. In addition to its significance for classroom practice, the findings of the study have implications for ways to address the lack of ILE visibility in the current Australian and Victorian Curriculum Frameworks, with an emergent model of a set of benchmarks to guide whole school information practice which enables students to develop their own 'repertoires' of information strategies. The qualitative study was conducted at a Victorian secondary school and showed that teachers can change their practices to incorporate ILE into their subject curriculum design and classroom teaching. It involved Participatory Action Research (PAR) by case groups of teachers at three different year levels. Over a year they used cycles of reflective action to explore ways that Informed Learning ideas might enhance subject learning by bringing explicit attention to expert information strategies. The findings show that this professional development process successfully transformed teachers' understandings about ILE such that they came to see it as their responsibility. They identified the need for students to develop expert skills to operate successfully in the rapidly changing information environment and the need for teachers themselves to learn new pedagogies to help their students develop such repertoires of information strategies. They also recommended that a whole school approach was required to ensure such teaching presented consistent understandings and practices to students, and that time and support was provided for teachers to develop the capabilities required. From these findings, the author developed a set Benchmarks for Repertoires of Information Strategies to provide a framework for whole school information practice within which such strategies and practices might be developed. The author contends that without meeting the ten criteria in the Benchmarks, a school would have difficulty enabling its students to be properly equipped for their information futures.

This is a referred article

Introduction

Christine Bruce's *Informed Learning* (2008) was designed as a professional development process to enable educators and library professionals to bring explicit attention to ways expert information strategies can be learned as part of discipline learning. Its Six Frames for Informed Learning provide constructs to enable teachers to be explicit in curriculum design about how information

will be used in each learning activity to develop subject information mastery. The Seven Faces of Informed Learning provide constructs for teachers to help students become aware of and develop different information strategies so that they can become expert users of information and ICTs within and across subject contexts.

What information strategies do I want students to learn?

The Six Frames for Informed Learning brings attention to the type of learning about subject information use that the teacher intends, asking: What information strategies do I want students to learn? What information will be used in this subject learning activity and how will it be used to enable students to gain a holistic understanding about expert discipline information strategies?

Six Frames for Informed Learning - pay attention to the type of learning about subject information use that will take place	The teacher asks questions: to establish clarity with colleagues and students about the learning intentions involved in the way information is to be used in subject learning activities
First Frame: Content	what should students <i>know about their subject and about the world of information?</i>
Second Frame: Competency	what do we want students <i>to be able to do with information</i> in the subject learning task and at what <i>level of competence?</i>
Third Frame: Learning to Learn	what should students know about how <i>experts in their subject area construct knowledge?</i>
Fourth Frame: Personal Relevance	how do we enable students to find the <i>personal relevance</i> of this information use activity?
Fifth Frame: Social Impact	how will students explore the <i>social impact</i> of information use practices?
Sixth Frame: Relational	how do students gain an <i>overall view</i> of use of information: how do they bring <i>critical awareness and reflection</i> to different ways of seeing and experiencing?

Figure 1. Six Frames for Informed Learning

The Seven Faces of Informed Learning brings focus to the experience of using information for subject learning, with the teacher asking: How can I draw student attention to the different ways that information strategies, ICTs and discipline content are used to develop discipline information mastery? What experiences will I build into in learning activities so that they can gain a holistic understanding about appropriate strategies to use in a variety of learning contexts?

Seven Faces of Informed Learning- brings focus to the type of information experience intended	The teacher asks questions - to establish what is to be the focus of attention in the experience and what will be on the margins or periphery of the experience:
First Face: Information Awareness Experience	<ul style="list-style-type: none"> • focus: how we can use information technology collaboratively with others to gain awareness of relevant information? • marginal and peripheral: how we successfully share and scan and select information in that 'social' form?
Second Face: <i>Sourcing</i> Information Experience	<ul style="list-style-type: none"> • focus: the nature and location of the information sources themselves • marginal and peripheral: using information technology to find information sources
Third Face: <i>Information Process</i> Experience	<ul style="list-style-type: none"> • focus: the processes we use to apply and interpret the information we find in different disciplines • marginal and peripheral: how we use information technology in that process
Fourth Face: <i>Information Control</i> Experience	<ul style="list-style-type: none"> • focus: how we manage the information we find • marginal and peripheral: how we use information technology to assist management
Fifth Face: <i>Knowledge Construction</i> Experience	<ul style="list-style-type: none"> • focus: the critical analysis strategies used to engage and come to know the information in the context of the discipline • marginal and peripheral: how we incorporate that new understanding into our discipline knowledge base, and how information technology can be used to do so
Sixth Face: <i>Knowledge Extension</i> Experience	<ul style="list-style-type: none"> • focus: explicit awareness of the 'intuitive' capacity we have to make links between new information, a knowledge base and creation of new knowledge • marginal and peripheral: the developing knowledge base and use of information technology in these processes
Seventh Face: <i>The Wisdom</i> Experience	<ul style="list-style-type: none"> • focus: explicit awareness of the values we bring to the use of information and creation of new knowledge, • marginal and peripheral: the developing knowledge base and use of information technology

Figure 2. Seven Faces of Informed Learning

In my teacher-librarianship career I was frustrated that despite trying many different ways of having expert information use become part of teacher and student discipline practice, it tended to be seen as a 'library skill', applied in research classes, and taught by teacher-librarians. The various ILE models developed over the years, while useful for research classes, seemed to reinforce a library-centric view which was at odds with the increasingly 24/7 nature of information access. I felt that a way needed to be found to ensure that students learned good information strategies as part of their classroom subject learning which they could then apply independently in the new information environment. Informed Learning seemed to provide an answer, so I used its constructs in a PhD study in a Melbourne secondary school to investigate whether they might provide a way to bridge the historical gap between information literacy theory and teacher practice. As researcher and participant, I used the qualitative methodologies of multiple case study and Participatory Action Research (PAR) to work with 25 teachers and teacher-librarians in three case groups over a year to conduct five action cycles over a year. Participants in the case groups developed common understandings about Informed Learning which they transferred into their own teaching practices, showing a transformation such that they came to see ILE as their responsibility.

The research findings showed that the interdisciplinary collegiality developed by the case groups enabled valuable shared reflexive professional learning about information practices as they used the action cycles of PAR. Teachers identified expert information use as an essential skill for student learning across the curriculum and they said that teachers needed to explicitly teach information strategies in each of their subject areas as part of subject learning. They said that their teaching roles were changing, as they were no longer the intermediaries to information accessed by students for learning and they explored ways that reflective, collegial practice and explicit modelling might assist students to develop their own subject information mastery. Teachers in the study also indicated that a whole school approach to teaching information strategies was needed to ensure that students experienced cohesive approaches to information use and to learning information strategies within and across subject areas.

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The significance of these findings lies in the way the study showed that the two transformative processes of PAR and Informed Learning can be combined for powerful professional development which builds teacher capacity and shared understandings over time for transfer into long-term changed practices. To operationalise these findings, I recommend that schools commit to a whole school information practice which uses a holistic approach to building teacher capacity to explicitly model and build student information strategies. Such a commitment is required for a school to enable its teachers and students to become expert information users who can operate safely and ethically in a dynamic information environment and who can build knowledge and apply it creatively in ever-changing contexts. I have proposed a set of Benchmarks for

Repertoires of Information Strategies which provides ten criteria to guide the development of a such a whole school practice. Part of the Benchmarks is the suggestion that each school develop its own Information Practice Statement, which would be part of the school's curriculum framework, providing explicit statements about the ILE practices, pedagogies and learning to be incorporated into course design, teaching, assessment and reporting.

These findings have additional significance in relation to the need for Australian teachers to build the understandings and pedagogies required to incorporate ILE alongside the general capabilities and cross-discipline priorities of the Australian Curriculum and the general capabilities of the Victorian Curriculum. My analysis of both the Australian and Victorian Curriculum frameworks supports previous research by Lupton (2014) which indicated that while many of the desired skills and processes involved in information literacy learning have been incorporated into the frameworks of subjects and general capabilities, there has been a loss of explicit statements about information literacy as a distinct competency. A similar situation was found by Prucha (2017) regarding digital literacy in the Victorian Curriculum. This needs to be addressed otherwise there will be no explicit understanding within schools about what information literacy constitutes, how it is to be taught and how student information literacy learning will be demonstrated and reported. This is despite international and national bodies clearly indicating the need for students to possess sophisticated information strategies which they can apply independently in evolving information environments.

This article discusses ways that the Benchmarks for Repertoires of Information Strategies might assist schools address these two current crucial issues involving development of teacher capacity for ILE.

Benchmarks for repertoires of information strategies

The Benchmarks for Repertoires of Information Strategies consists of ten descriptive criteria to use as reference points when developing structures, programs and practices to support ILE in secondary schools. The goal of these Benchmarks is to establish a school-based culture that supports students' development of their own repertoires of information strategies to enhance their learning in the future, both as students and lifelong learners.

It is proposed that these ten 'benchmarks' or criteria must be present for a school to achieve this goal. The term 'benchmarks' is defined as: "a point of reference from which quality or excellence is judged" (Macquarie Dictionary Online, 2003-). I contend that these ten Benchmarks are required for a school community to provide the conditions by which teachers bring reflective attention to their own practices as discipline experts and design learning opportunities where discipline information strategies are explicitly taught as part of the curriculum. This will, in turn, provide conditions where students can develop their own repertoires of information strategies. The Benchmarks should be viewed as an integrated and mutually supporting set, requiring all to be implemented if the goal is to be achieved. Each is presented below with reference to findings in the study, related literature, significance for practice and implications for future research.

Benchmarks for Repertoires of Information Strategies: A Framework for Whole School Information Practice	
Information Literacy Education (ILE) in a secondary school should meet these criteria:	
1.	Repertoires of Information Strategies: the goal of students' development of individual repertoires of information strategies for future learning is seen as a whole school problem, articulated in an Information Practice Statement which sits as part of the school's curriculum framework
2.	Holistic ILE model: the school has selected a holistic model of ILE which develops and guides teacher practice, such as an Informed Learning Model for Secondary Schools
3.	School leadership for whole school information practice: development of repertoires of information strategies and associated practices stipulated in the Information Practice Statement are mandated, championed and modelled by school leadership
4.	PAR for ILE professional development: the Information Practice Statement is interpreted and integrated into discipline practice by collaborative school teams engaged in ongoing ILE professional development such as the Informed Learning Praxis Model
5.	Explicit integration of information strategies: information strategies and ICTs are selected for explicit integration into discipline learning intentions, activities, outcomes, feedback and reporting processes
6.	Explicit modelling of Discipline Information Mastery: teachers are explicit with colleagues and students about information practices which select and use information strategies and ICTs for discipline information mastery
7.	Reflective Information Use: teachers engage with colleagues and students to bring reflective attention to variation of aspects of information use, discipline content and ICTs used in learning experiences
8.	Teacher Librarians in curriculum design for ILE: teacher librarians bring their information and ICT use expertise to collaborative teaching teams for curriculum design and teaching
9.	Library and information architectures, resources and spaces for ILE: sophisticated library and information architectures, resources and learning spaces provide for both the physical and digital experiences of developing and using expert information strategies for learning
10.	Documenting and reporting ILE research: the program's progress is documented as part of ongoing PAR at the school and its results are reported into the field to provide reflective, peer reviewed data for evidence-based practice

Figure 3. Benchmarks for Repertoires of Information Strategies

Criterion one: Repertoires of information strategies.

...students need cohesive experiences of information use across discipline areas for development of their own individual sets...

Teachers in the Informed Learning PAR study felt that the main goal for ILE was to develop students' meta-understandings about the information strategies required for the evolving educational environment and their future lives. They agreed that students need cohesive experiences of information use across discipline areas for development of their own individual sets, or 'repertoires', of information strategies for future learning, and that a whole school approach was required to achieve such cohesion.

Accordingly, *Criterion One* specifies that the goal of development by students of individual repertoires of information strategies for future learning is seen as a whole school responsibility by school

leadership, teachers, parents and students and is specifically included in whole school mission and goal statements. The following Criteria Two to Ten describe how the goal should be implemented and its achievement monitored and reported.

Applied in practice, this criterion would mean that a school-specific Information Practice Statement would be required to guide the practices and structures by which students might develop their own individual repertoires. It would sit as part of a school's curriculum framework priorities and provide for development of levelled descriptions of the strategies for inclusion in discipline learning curricula as part of or alongside relevant discipline, general capability and cross-curriculum priorities. A holistic information literacy model would be used to guide explicit teaching of the information strategies, addressed in Criterion Two.

Statements within existing literature have extensively explored practices and strategies relevant to such a statement, usually expressed in terms of information literacy or information skills (ALIA & ASLA, 2016a – 2016d; IFLA, 2015). Elements from those statements which enable development by students of their own repertoires of information strategies could be selected and reframed for the purpose, including statements about the strategies required for expert use of ICTs and digital technologies. Informed Learning (2008) also contains constructs to guide this process. In Australia, some of the terminology used to refer to information use in the Australian Curriculum general capabilities could be used to assist easier incorporation of the information strategies into curriculum design (ACARA, 2017; OECD, 2018a; McIlvenny, 2019). As explained in Criterion Eight, teacher-librarians in the school would play an important role in developing and implementing these strategies given their demonstrated experience internationally and nationally (FitzGerald, 2015; Lupton, 2014; McIlvenny, 2019; Wall & Bonanno, 2014a, 2014b).

Responsibility for ensuring this statement is developed, and its practices and strategies implemented and evaluated would lie with the school executive, including the principal and heads of department, in collaboration with teacher-librarians (ASLA, 2013; Hartzell, 2002; Hay & Foley, 2009; Henri, Hay & Oberg, 2002a; IFLA, 2015).

The information practices and strategies would need to be explicitly articulated in discipline learning throughout the school. That would involve mapping the existing curriculum to ascertain where the identified practices and strategies already exist or need to be incorporated, and how they are to be assessed and reported along with discipline knowledge, other general capabilities and cross-curriculum priorities (FitzGerald, 2015; Lupton, 2014; McIlvenny, 2013a, 2019).

Given current concerns about school readiness to teach general capabilities (Akshir Ab Kadir, 2018; McIlvenny, 2019; Scoular, 2018; Urban, 2019) there is a window of opportunity to present ways of developing clarity and process for building teacher capacity in the area, and a fully articulated statement about information strategies would demonstrate a way that others

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might similarly be achieved. As suggested by McIlvenny, (2019), teacher-librarians have the knowledge and expertise to assist schools to develop policies and build capacity for general capabilities, and this is an opportunity to bring more focus to information strategies and the teacher capacities required for their teaching.

Criterion two: Holistic ILE model

The study's findings emphasised the importance of a holistic approach for successful integration of expert information strategies into curriculum learning. Teachers found that holistic understandings brought by Informed Learning enabled them to consider ILE from many different perspectives, and its inclusion of learning theory provided a familiar frame of reference for its application to their practices.

Accordingly, Criterion Two specifies that a holistic model of ILE, is selected for use across the school to direct teacher integration of cohesive approaches for students' development of independent repertoires of information strategies.

In practice, there might already be a holistic model in use in the school. For example, there are schools in Australia and internationally which use holistic approaches such as inquiry learning (FitzGerald, 2015, 2018; Lupton, 2014; Montiel-Overall & Grimes, 2013) and Guided Inquiry (Gregory, 2018; Maniotes & Kuhlthau, 2014; Scheffers & Joukhdar, 2016). Additionally, a number of teacher-librarians in Australian schools have explored how to map the strategies in these models to the Australian Curriculum in such a way that information literacy skills are taught, monitored and reported as part of discipline learning (FitzGerald, 2015; McIlvenny, 2013a, 2013b). It is a process not without its challenges because these skills are not consistently or explicitly articulated in the Australian Curriculum (Lupton, 2014), which is why the Benchmarks are so important in bringing clarity to where and how schools are developing students' information strategies. A similar situation has been found regarding the lack of clarity in the Australian Curriculum about teaching of literacy (Merga & Gardiner, 2018) and the need for a policy to direct integration and professional development as well as clear mapping of where and how it is being taught.

To achieve this criterion, any existing information literacy processes used in a school, such as the information skills process, inquiry learning, etc., would need to be checked and possibly adapted to meet the purpose defined in a school's goal for development of students' repertoires of information strategies. A holistic model such as a proposed (and yet to be developed) Informed Learning Model for Secondary Schools could be used to direct integration of existing information literacy processes with those developed as advised by an Information Practice Statement.

Criterion three: School leadership for whole school information practice

Research about the crucial role played by principals in determining the success of ILE in a school

was affirmed by teachers participating in the study who indicated that such leadership would be required for use of a holistic ILE model across a whole school.

Accordingly, Criterion Three specifies that school leaders mandate the development, implementation and evaluation of the policies, statements, models, processes and resources required to establish a whole school information practice by which students might develop their own repertoires of information strategies.

The significance for practice of this criterion is that principals need to take action to ensure students in their schools are developing the information strategies identified as key to effective operation in the evolving globalised information environment. This would require that mapping is done to reconcile the information strategies, digital literacy and digital citizenship knowledge and skills outcomes in the Australian Curriculum with the practices and strategies developed by using Informed Learning as part of the Information Practice Statement in a school. Lack of teacher training for the general capabilities in which most information strategies now reside in the Australian Curriculum (Akshir Ab Kadir, 2018; McIlvenny, 2019; Lucas & Smith, 2018; Wall & Bonanno, 2014a, 2014b), means there is little clarity about what ILE students are receiving (FitzGerald, 2015; QCAA, 2015). Principals could provide leadership within their school communities by mandating, championing and modelling the information practices and strategies detailed in a school-specific Information Practice Statement. Further, they could take a more active role in professional development to develop capacity for integration and modelling expert information use (IFLA, 2015). Research shows that their influence is key to effective information literacy programs in schools (Filipi, 2008; Hartzell, 2002; Henri et al., 2002a, 2002b; Hughes et al., 2013) with Merga and Gardener (2018) identifying a similar position for literacy teaching. Additionally, research shows that teachers find principals' closer engagement and more distributive leadership styles as factors which promote reflection and professional growth (Blase, 2000; Jones et al., 2014; Lucas & Smith, 2018; Robinson, Hohepa, Lloyd, & The University of Auckland, 2009). Some education authorities suggest this as a leadership style to be adopted (State of Victoria. Department of Education and Training, 2018b).

While there is considerable research about the importance of the principal's role to bring about teacher and teacher-librarian collaboration to develop information literacy programs in schools, (Church, 2010, 2017; Commonwealth of Australia. House of Representatives Standing Committee on Education and Employment, 2011; Henri et al., 2002a, 2002b) there is little about principals' active engagement in developing teacher practices which help students develop their own repertoires of information strategies. Opportunities for future research include the idea of principals and other members of school leadership joining their teacher colleagues in action research such as Informed Learning PAR. This would provide findings about the active role leaders can play as reflective practitioners in development of productive information pedagogies. Additionally, it would be a powerful way to gain commitment from school leadership and add value to the role of libraries and teacher-librarians.

Criterion four: Ongoing PAR for ILE professional development

The findings of this study strongly supported research about professional development for teachers which indicates that provision of time and resources are important factors in transfer of new ideas into long-term practice. Participants in the study found that by using the collaborative processes of PAR they could co-construct common understandings about Informed Learning and reflexively apply them to their own practices. Teachers in the three case groups nominated collegiality and cross-discipline learning as features of PAR which were key to their successful investigation of Informed Learning for ILE and for exploration of ICT affordances.

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Accordingly, Criterion Four specifies that a transformative professional development process, such as that provided by Informed Learning PAR, is used to build teacher capacity for integration of information strategies into their teaching practices.

In practice this would involve collaborative school teams, comprised of either single or multi-subject groups depending on circumstances, to engage in ongoing professional development. It would include reflexive co-construction of common understandings about information practices and strategies and how they are to be interpreted and explicitly transferred into design of curriculum and learning activities, including choices of ICTs for ILE.

The research findings of this study would suggest that the capacity-building for teachers involved in implementing the Benchmarks is best done in communities of practice. It is a process recommended by research about ways to build capacity in teachers and library professionals (Jones et al., 2014; Osborn, 2017). This is especially relevant for Criterion Four, and particularly in relation to development of teacher and teacher-librarian self-efficacy for implementation of the Australian Curriculum alongside information literacy processes and strategies, including ICTs and the associated digital literacies (FitzGerald, 2015; Wall & Bonanno, 2014a, 2014b). There is also a need for teachers to develop skills for effective collaboration in teams to ensure common approaches to teaching information strategies are used across the curriculum (McKeever et al., 2017; Montiel-Overall & Grimes, 2013). An aspect of that is development of common understandings amongst stakeholder groups about the role each plays in development of key information strategies by students (O'Neal, 2004; Wetzel Wilkinson & Bruch, 2012). Implications for future research arising from Criterion Four include further investigation of the understandings held by teachers, teacher-librarians and administrators about each other's roles in development of repertoires of information strategies.

For teachers to develop and maintain their capacities for adapting to the rapidly changing work environment of education, they need professional development which provides for continual reflective renewal and transformation (Bahr & Mellor, 2016) and increasingly it is stated as a key direction for continual school improvement at the education system level (State of Victoria.

Department of Education and Training, 2018b). Research by Gore and colleagues (2017) points to the most successful teacher professional development being that which enables them to be both learners and teachers, supports their needs, occurs within the school day, clearly links to practice, coheres with school and system policies and promotes transformative practice rather than accountability. Findings from their research builds the case for processes which develop inquiry habits and productive ways of collaborating with colleagues in the assessment and refinement of teaching so that it strengthens both intellectual and professional aspects.

The findings reported in the study discussed in this article reflect many of the above elements of successful teacher professional development, demonstrating that Informed Learning PAR has such processes and did deliver capacity-building for participants. The study provides a model for case groups of teachers within subject departments and across levels to collaboratively co-construct common understandings about information strategies. With such capacities, teachers can then explicitly integrate and refer to information strategies within discipline learning alongside integration of general capabilities and cross-curriculum priorities. The regenerative and recursive nature of such an approach to whole school information practice offers a way forward for teachers and teacher-librarians facing the challenges of a constantly changing educational environment (ASLA, 2013; Bruce, 2014; Budd and Lloyd, 2014).

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An implication for future research is to use Informed Learning PAR for teacher and teacher-librarian case studies about how their capacities can be developed for confident integration of information strategies within discipline learning, alongside integration of other general capabilities and cross-curriculum priorities. There is clear identification that capacity building is required for both areas, with interest in finding effective ways to do

so (Akshir Ab Kadir, 2018; FitzGerald, 2015, 2018; Lucas & Smith, 2018; Lupton, 2014; McIlvenny, 2019; Scoular, 2018; Wall & Bonanno, 2014a, 2014b). Development of capacities for effective collaboration in teams has also been identified as a professional learning need (McKeever et al., 2017; Montiel-Overall & Grimes, 2013) and one which can be facilitated by Informed Learning PAR.

Criterion five: Explicit integration of information strategies

The study referenced the history of ILE research to develop models which enable integration of common approaches to information use in curriculum design so students can learn to use and apply information strategies. Teachers in this study identified explicit and common approaches to information use as an important aspect of integrating ILE teaching and learning into curriculum design. They also identified the need for informed and explicit choices to be made about use of ICTs for teaching and learning. The study showed how they used Informed Learning's Frames and Faces constructs to guide, report and discuss ways they integrated information strategies and ICTs into discipline learning.

Accordingly, *Criterion Five specifies that there should be explicit integration of information strategies and ICTs into discipline learning intentions, activities, outcomes, feedback and reporting processes.*

In practice this would mean that a school's Information Practice Statement would provide a plan for its integration into the curriculum; a model by which it will be integrated, such as Informed Learning and a professional development process, such as Informed Learning PAR to build teacher capacity for integration of the information strategies.

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A plan for contextual integration of information strategies into discipline learning and how it might be clearly mapped across the school would provide for:

- development of levelled generic statements about information strategies for their easy integration into appropriate discipline learning, either alongside or as part of general capabilities and cross-curriculum priorities;
- mapping where they are taught, assessed and reported as part of discipline learning;
- the pedagogies used to enable engagement, application and transfer to new learning contexts;
- ways that teachers might engage with students as collegial practitioners to reflect about the way information is being used to develop discipline mastery; and
- how students are building up their own repertoires of information strategies.

There is indication that while the steps of the information process have been integrated into the Australian Curriculum's general capabilities and from there into many of the discipline learning standards, there is lack of clarity about where they are and how they are being taught (Lupton, 2014; McIlvenny, 2019). A search across the mapping software of the Australian Curriculum website (ACARA, 2017) enables discovery of where they are, but their subsumption into the general capabilities has meant that their existence as an independent set of strategies for use in future information-use contexts is not explicitly presented. A similar situation exists for literacy learning (Merga & Gardiner, 2018).

Attempts are being made to map where they exist at present, and how they might be consistently taught, monitored, assessed and reported (FitzGerald, 2015; Lupton, 2014; McIlvenny, 2019; Scoular & Heard, 2018; Wall & Bonanno, 2014a, 2014b), but further work is needed in each school to guide their integration, mapping and teaching, and determining how student development of the strategies is being monitored. Additionally, as discussed in Criterion Four, teachers need professional development to enable them to explicitly integrate the strategies in such a way that they enhance discipline learning whilst also enabling students to develop their own relational understandings of information use by which to build their individual repertoires of information strategies.

Implications for future research sit in the field where work has started on developing such a plan (FitzGerald, 2015; Lupton, 2014; McIlvenny, 2019; Scoular & Heard, 2018). There is yet to be articulation of what the plan might look like in terms of the information strategies to be taught and the level descriptors for each; the common approaches by which they will be taught explicitly, reflectively and collaboratively; and how they will be monitored, assessed and reported.

Criterion six: Explicit modelling of discipline information mastery

The findings of this study are closely aligned to research by Bruce and colleagues (Hughes & Bruce, 2012a, 2012b; Feekery, 2013; Smeaton et al., 2016; Maybee et al., 2018) regarding the need for explicit and reflective modelling of expert information strategies by educators. Participants in the ILARC project explored ways to incorporate such modelling into a variation of learning activities across disciplines so that students might develop relational understandings about the different ways that information and ICTs are used by discipline experts. They also explored ways to incorporate explicit information use guidance at appropriate learning stages, referencing the process approaches common to inquiry learning ILE. Teachers in this study recommended more explicit reference to information strategies in discipline learning. They found that by changing their roles to engage in more explicit and reflective modelling of information strategies and ICT use with students that discipline information mastery could be a shared learning experience.

Accordingly, Criterion Six specifies that teachers should be explicit in articulating to colleagues and students about their own information strategies and the reasons why and how particular information and ICTs are being used.

The significance for practice of this criterion lies in the way teachers in this study found improved positivity and self-efficacy when they changed their roles and developed new skillsets to meet the challenges posed by the rapidly evolving information environment. They said that as they were no longer the intermediaries for the sources their students used to learn, they needed to constantly change their pedagogies to help students independently evaluate their use of information (Bahr & Mellor, 2016). The findings of this study showed significant empowerment when teachers used the action cycles of Informed Learning PAR to trial different ICTs within the collegial environment of case group action cycles and investigated ways they could explicitly

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explore different information strategies with their students to enhance learning and develop discipline information mastery. Such methods were encouraged by Wall and Bonanno (2014a, 2014b) in their analysis of professional development models to enhance teacher and teacher-librarian capacity to meet the demands of the changing information environment and the Australian Curriculum.

In practice this criterion would require that schools use Informed Learning PAR to build capacity for development and use of pedagogies which explicitly model discipline information mastery

(Bruce, 2008). Given the identified challenges faced by teachers poorly prepared for the demands of teaching the general capabilities in which information literacy strategies now sit (Urban, 2019), schools might well use Informed Learning PAR for that purpose also. As a process which enables teachers to be both learners and teachers, addressing the elements of what constitutes successful professional learning for teachers as identified by Bahr and Mellor (2016) and Gore, et al. (2017) it does meet the challenges faced by teachers undertaking professional development to incorporate more pedagogies into a crowded curriculum.

Implications for future research lie in the already-identified area of Informed Learning PAR by which case groups of teachers would use action cycles to investigate, trial and report information strategy teaching and the affordances of ICTs for using information to learn. It would focus on how to explicitly model discipline information mastery for and with students as they develop their own mastery. An additional aspect of that might be the gathering of data about the impact of such interventions on student development of their own repertoires of information strategies. This fits with research directions identified by Bruce and colleagues (Bruce et al., 2017) which

takes into account learners' existing experiences of information use, using reflection to enhance awareness; promotes simultaneous learning about discipline content and the information using process; and brings about changes in learners' experience of information use and of the subject being learned (p. 6).

There has been little use of Informed Learning PAR in secondary schools to develop teacher efficacy in the teaching of information strategies, and this would contribute to a greater understanding of what this would look like, how it would work and resultant outcomes.

Criterion seven: Reflective information use

Criterion Seven arises from the study's findings about the importance of reflective information use as a practice by teachers and students. Other researchers have used Informed Learning (2008) to develop understandings about information use as being a reflective practice by teachers and students where together they explicitly explore strategies for expert information use (Herring, 2011a, 2011b; Hughes & Bruce, 2012a, 2012b; Feekery, 2013; Smeaton, et al., 2016; Maybee et al., 2018). Informed Learning also emphasises the importance of discovering the student perspective of learning to use information strategies for better teacher reflection and understanding about ways to engage and support them.

Informed Learning also emphasises the importance of discovering the student perspective of learning to use information strategies...

Bruce's research (1997) brought attention to considering people's individual perspectives of information use experiences in development of practices and strategies for using information to learn, and her Informed Learning approach provided constructs to bring teacher attention to this aspect of ILE. Teachers in this study used Informed Learning's Six Frames and Seven Faces

constructs to bring attention to their own and their students' experiences of information and ICT use, how that might enable more effective teaching and learning about discipline information strategies and how they might gather data about the student perspective. Accordingly, *Criterion Seven specifies firstly that teachers engage with colleagues and students to bring reflective attention to the variation of aspects of information use, discipline content and ICTs used in learning activities across the curriculum. Secondly, it specifies that a school's Information Practice Statement incorporates reference to processes by which teachers might discover and respond to students' perspectives of their information use experiences.*

In practice, implementation of this criterion would require that a school builds capacity in its teachers to use the constructs of a holistic ILE approach such as Informed Learning to engage as reflective practitioners (Schon, 1983). This would contribute to the self-efficacy required for discussion with colleagues and students about ways information is being used in subject learning across the curriculum and whether cohesive approaches are being used by which students might develop their own repertoires of information strategies. In this study, use of a common set of constructs ensured that similar ILE understandings were being used in discussions and information use approaches across the disciplines, affirming distinctions about information literacy as a site ontology (Budd & Lloyd, 2014; Kemmis et al., 2010; Lloyd, 2010a, 2014; Schatzki, 2005). Future research about ways that reflective practitioner relationships might be developed using Informed Learning terminology and constructs would be a valuable contribution to growing understandings about a need to build teacher capacity for explicit use of information practices and strategies as part of a whole school information practice.

...'student voice' can be used as a reflective tool to aid collegial discussions about students' use of information and development of their own sets of information strategies.

Additionally, this criterion would require processes to be incorporated into discipline curriculum and pedagogies to enable discovery of students' perspectives of learning activities involving information strategies, currently referred to in education as 'student voice'. That also would require use of common sets of terminology to ensure all involved brought similar understandings. Data about student perspectives of such learning activities achieves three purposes. The first is for

use in formative assessment so that teachers can respond to students' learning development by adjusting instruction and the style of the learning activity while learning is progressing. The second is to empower students in their own learning by enabling agency and contribution to improvement in the learning program. This has been shown to contribute positively to student learning outcomes (Hattie, 2010; Hattie & Timperley, 2007). Lastly, 'student voice' can be used as a reflective tool to aid collegial discussions about students' use of information and development of their own sets of information strategies. Teachers in the study used a variety of tools to discover the student perspective and said that it enabled reflective learning by students, provided a guide about the effectiveness of the activity and also gave the 'quiet' students in classes an opportunity to give voice to their questions and learning.

Processes for gathering student voice are already in place throughout Australian schools (*An audit of school practices around: Student voice, agency and participation*, 2019; State of Victoria, 2018a; NSW. Centre for Education Statistics and Evaluation, 2018; Government of South Australia. Department for Education and Child Development, (n.d.)). The gathering of students' perspectives about their information strategy development within discipline learning can use existing processes already familiar to administrators and teachers.

Herring (2011a) identified the need for more research about the student experience of ILE to inform development of models which enabled the student reflection about their learning, important for transfer to new learning contexts. Researchers in the Informed Learning domain have used this process to enable more powerful ownership by users of information for learning (Bruce et al., 2014; Budd & Lloyd, 2014; Feekery, 2013; Gunton et al., 2012; Hughes, 2014a; Hughes & Bruce, 2012a, 2012b; Maybee et al. 2016, 2018; Smeaton et al., 2016). Some inquiry learning and Guided Inquiry practitioners and researchers have included student voice as part of their processes (FitzGerald, 2015; Garrison et. al., 2018; Gregory, 2018; Hay, 2017). Future research about gaining student voice as part of a deliberate plan in which secondary students develop their own meta-structures of information literacy strategies would be an important part of incorporating the Benchmarks as well as providing data for evidence-based practice for its future development and application.

Criterion eight: Teacher-librarians in curriculum design for ILE

ILE research has long emphasised the importance of collaboration between educators and library staff to enable effective integration of information use expertise into teaching practice. National and international standards have specified that school leaders have a crucial role to play to achieve this collaboration. They need to ensure that teacher-librarians are well-positioned and effectively supported to enable their involvement in curriculum design and delivery which integrates ILE into teaching and learning. This study demonstrated that the involvement of teacher-librarians as facilitators and fellow participants in Informed Learning PAR case groups brought appreciation of the teacher-librarians' information and ICT expertise and enabled co-construction of common understandings about ways to incorporate information strategies and ICTs into discipline practice.

Accordingly, Criterion Eight specifies that the school's ILE program includes teacher-librarians who bring their information and ICT expertise to collaborative curriculum design and teaching.

The practice significance of this criterion is that teacher-librarians in a school would provide the expertise to guide overall development of the school's Information Practice Statement (ALIA & ASLA, 2004, 2016a-2016d; ALIA & Victorian Catholic Teacher-librarians (VCTL), 2017; ASLA, 2011; Hughes, 2014b; IFLA, 2015) as well as ensuring that it is reflected in library policies, programs and resources (ACT Government, 2016; NSW. Department of Education, 2017). Teacher-librarians would also play a major role in its implementation, including:

- designing and implementing the professional development by which individual teachers and teaching teams become familiar with its concepts, such as Informed Learning PAR;
- facilitating the process of extracting and documenting the levelled descriptions of information strategies which comprise an agreed repertoire of information strategies to be developed by students, in collaboration with key learning areas (KLAs) and year level teams; and
- working with KLAs and year level teams to determine how the information strategies are implemented in curriculum design, teaching practice and student learning of discipline content, general capabilities and cross-curriculum priorities using a model such as the Informed Learning Model for Secondary Schools.

Researchers and leading practitioners recommend that teacher-librarians can bring important expertise to the work of integrating information strategies into the Australian Curriculum (FitzGerald, 2015; Lupton, 2014; McIlvenny, 2019; Scoular & Heard, 2018; Wall & Bonanno, 2014a, 2014b). As identified in Criterion Three, the principal's role is vital to ensure the teacher-librarians are given delegated responsibility to ensure they are involved in development of policies, procedures, curriculum development and for leadership in professional development for teacher capacity building (Filipi, 2008; Hartzell, 2002; Henri et al., 2002a, 2002b; Merga & Gardiner, 2018). It is important that the implementation of a school's Information Practice Statement is addressed as a whole school responsibility rather than residing solely in the domain of the school library.

...the principal's role is vital to ensure the teacher-librarians are given delegated responsibility to ensure they are involved in development of policies, procedures, curriculum development...

There are implications for future research in secondary schools to build on this study's research and that by researchers who are using Informed Learning PAR to develop capacity in tertiary teaching teams to enable students to develop their own information strategies (Feekery, 2013; Hughes, 2014a; Maybee et al., 2016, 2018). Teachers in this study made positive comments about the benefits of having a teacher-librarian lead their Informed Learning PAR case groups, and teachers and teacher-librarians said they gained new understandings about each other's expertise when they worked together in case groups. Improved collaboration for the teaching of ILE has been examined at length in school library research (Gibson-Langford, 2009; IFLA, 2015). An important opportunity for future research is the investigation of ways that Informed Learning PAR can develop improved collaboration between teachers and teacher-librarians for cohesive integration of common approaches to teaching information strategies, general capabilities and cross-curriculum priorities.

Criterion nine: Library information architectures, resources and spaces for ILE

The Informed Learning theory used in this study recognises that information use is an experience

...design of the physical and digital spaces for information use needs to recognise the perspectives of those who will undertake its teaching and learning.

which takes place in situated social circumstances. This has given rise to understandings that design of the physical and digital spaces for information use needs to recognise the perspectives of those who will undertake its teaching and learning. Teachers in this study showed that Informed Learning constructs can enable critical attention to be brought to ways that the library's print and digital resources and ICT tools of the school's learning management system might enhance information use in teaching and learning.

Accordingly, *Criterion Nine specifies that the ILE program is resourced by sophisticated library and information architectures, resources and learning spaces to provide for both the physical and digital experiences of using information.*

The significance for practice of Criterion Nine is that for students to develop their own individual repertoires of information strategies they need guided experience, reflection and application of the strategies involved in using high quality and authoritative information resources in physical and digital spaces designed for that purpose (Bruce & Hughes, 2010; IFLA, 2015). There have been many guidelines established to determine what is required for 21st century learners in terms of the physical library spaces, ICT infrastructures, resources, staffing, digital and print resources. Unfortunately, there is a trend across Australia to view ICT infrastructure and the associated digital literacies as replacements for school libraries and their digital and hard copy resources and the development of information strategies to use them effectively for learning (ASLA, 2010, 2011). I contend that unless students experience guided reflective use of authoritative resources for their discipline learning they will not have the strategies to apply in their futures as students and lifelong learners, as documented by Kuhlthau's (2018) longitudinal study.

...unless students experience guided reflective use of authoritative resources for their discipline learning they will not have the strategies to apply in their futures as students...

There are already statistics and guidelines in place which specify why school libraries are required and what their spaces, staff and resources should comprise. The significance for practice of this criterion is for governments and schools to use those guidelines to invest in school libraries and their spaces, information infrastructure, resource collections and the trained staff to work collaboratively with teachers to implement a holistic ILE model which enables students to experience expert use of authoritative resources for discipline learning.

The implications of this criterion for future research involve further investigation of ways that use of these spaces, architectures and resources is linked to student development of their own repertoires of information strategies. With regard to library space design, it is a research trend which has brought a focus on the learning which is intended, transforming views of libraries from

being seen as static resource repositories to being spaces to learn with information (Hay, 2010; Hughes, 2015; Sullivan, 2014; Whisken, 2017a) with more focus on stakeholder perspectives and agency (Hughes, 2015). Informed Learning ideas have been applied to design of information architecture to support students in blended learning environments so that ICT tools enable better use of information to learn (Bruce et al., 2012; Whisken, 2016a). Research involving this criterion would link Benchmarks goals to the library and information infrastructures required to achieve them and undertake research to investigate the role they play in building teacher capacity to integrate and teach information strategies as part of discipline learning alongside the general capabilities and cross-curriculum priorities.

Data resulting from such research could contribute to evidence that the school is targeting its resources for improved learning by students, a key direction in continuous school improvement plans by educational authorities, such as that of the Victorian Education Department (State of Victoria, 2018b). This would also add to school library research that provides evidence about the positive impact of school library programs on student learning (ALIA & ASLA, 2013; Godfrey & Neilson, 2018; Hartzell, 2002; Hay 2010; Hughes, 2014b; Kuhlthau & Todd, 2005a, 2005b; Todd & Kuhlthau, 2004; Todd, 2005, 2009, 2014), but could be targeted to a particular school's and education system's goals, giving the results greater weight in terms of more localised evidence.

Criterion ten: Documenting and reporting ILE research

There have been consistent calls in the field of ILE in schools for more research and documentation to inform practice, usually with an emphasis on the role of school libraries and teacher-librarians. This study took a different approach to the research path. It set out to explore ways that the problem of ILE might be transformed so that classroom teachers themselves might see its teaching as their responsibility - as part of their own subject teaching practice, working with teacher-librarians to explicitly integrate, articulate and model expert information practice as reflective practitioners with colleagues and students. It combined two professional development processes which have demonstrated success in enabling transformative change in education: Informed Learning, which is designed to build capacity in educators to integrate ILE into discipline learning; and PAR, which is designed to build group capacity for ownership of the resolution of defined problems. In this study, the combination of Informed Learning PAR transformed understandings about ILE which was transferred into new practices in discipline learning across the curriculum. Additionally, this combination provided structure and rigor for evidence-based practice to be reported in the field.

Accordingly, Criterion Ten specifies that the ILE program's progress is documented as part of ongoing action research at the school and its results are reported into relevant fields of education - including curriculum development, administration and professional development sectors, school and academic librarianship, information science, informed learning and PAR. This will provide much-needed reflective, peer reviewed data for the continued evolution of teacher practice approaches to the problem of developing individual student repertoires of information strategies.

The significance for practice is that use of PAR by a school to achieve the goal of greater teacher capacity to make changes to their information use practices can also deliver capacity to adapt to directives in an ever-changing educational environment, such as teaching general capabilities and cross-curriculum priorities as part of discipline learning (ACARA, 2017; ASLA, 2013; Hughes, 2014b). By gathering evidence about improvements to student learning in these three target areas, the school can report its achievement of other directives such as continuous school improvement (State of Victoria. Department of Education, 2018a).

The opportunities presented by this criterion for future research lie in two areas. The first direction is for further use of Informed Learning PAR in secondary schools for professional development to build teacher and teacher-librarian capacity for collaborative practices to enable student development of repertoires of information strategies. The second direction is for research to explore application of the Benchmarks within individual school settings to see how each criterion contributes to the development of a whole school approach to support teachers and students as informed learners who develop their own individual repertoires of information strategies. The results of this study suggest that Informed Learning should be used to provide the holistic ILE approach required in the Benchmarks, and that other ILE models such as inquiry learning or *Guided Inquiry* might also be used as part of the choices being made within an Informed Learning understanding. This study has also demonstrated the success of using PAR and multiple case groups as approaches to deliver teacher professional development, as detailed in Criterion Four.

Summary

This section discussed findings of the study reported in this thesis that a whole school approach is required for resolution of the problem of ILE, in which teachers provide consistent approaches to information use in their practices across disciplines so that students can develop their own repertoires of information strategies. Findings leading to this proposal were firstly, identification by teachers in the study that the main goal of ILE is development by students of their own sets of information strategies to use for study and lifelong learning in an increasingly complex information environment. Secondly, they identified that it was the responsibility of teachers to change their practices so they could enable such development within discipline learning, and that they as teachers needed to develop information use understandings and ICT capacities to do so. Lastly, teachers said that a whole school approach is required to ensure their practices incorporate consistent and explicit use of information strategies within and across disciplines.

The Benchmarks describe the characteristics of a whole school approach required for students' development of their own repertoires of information strategies. It incorporates use of a holistic approach to ILE, such as Informed Learning and a transformative process of professional development, such as Informed Learning PAR. The findings of this study provided an example of key elements of the Benchmarks in operation, showing teachers that they can change their practices to consistently integrate and model expert information strategies, another of the essential points of the Benchmarks.

The significance for practice of the Benchmarks lies in the way it brings together key elements arising from the findings of the PhD study. It provides a framework for whole school information practice by which students might develop their own repertoires of information strategies, identified by teachers in the study as required by students to operate successfully at school and in their future lives.

This is a referred article

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Anne Whisken has studied and worked in the library field for many decades, chiefly in school libraries. Her research journey has mostly involved action research to inform library practice and design, including a PhD currently under examination at Charles Sturt University. She used the qualitative methodologies of multiple case study and Participatory Action Research (PAR) to investigate ways that teachers might use Informed Learning ideas to close the gap between information literacy education theory and practice.