

Student inquiry and curriculum integration

Ways of learning for the 21st century? (Part B)

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KEY POINTS

- Commentators suggest that education needs to change to support students to be 21st-century learners.
- A 21st-century curriculum enables young people to be able to *do things* with knowledge and provides active problem-solving learning experiences.
- Some approaches to inquiry and integrated inquiry are more aligned with the principles of a 21st-century curriculum than others.
- There is no one recipe for getting the balance right. The use of a mix of integrated or inquiry approaches (rather than one generic approach) may help schools to create 21st-century learning experiences.

This article explores what approaches to inquiry and integrated inquiry might look like if given a 21st-century learning frame. It is the second of two articles about student inquiry and curriculum integration. (Part A appeared in *set* no. 3, 2012.)

Introduction

This is the second of two articles about student inquiry and curriculum integration. The main aim of these articles is to support teachers and school leaders to reflect on any inquiry and integrated-inquiry approaches in use at their school and consider their fit with *The New Zealand Curriculum (NZC)* (Ministry of Education, 2007). The first article, Part A, defines student inquiry and curriculum integration, and explores the characteristics and origins of five different integrated and inquiry approaches that are used in schools (Boyd and Hipkins, 2012). This article, Part B, explores what approaches to inquiry and integrated inquiry might look like if positioned within a 21st-century learning frame.

The article draws on many studies conducted between 2005 and 2010 that explored the implementation of *NZC* across the primary and secondary sectors. These included the Curriculum Implementation Exploratory Studies (Cowie et al., 2009; Hipkins, Cowie, Boyd, Keown, & McGee, 2011; Hipkins, Cowie, Boyd, & McGee, 2008) and *Shifting the Frame* (Boyd & Watson, 2006). Through these studies we observed that student inquiry and curriculum integration were becoming increasingly popular in New Zealand schools and were often—but not always—combined (in this article we have called this “integrated inquiry”). When we visited schools we talked to teachers who were unsure about what the “using information” or “taking action” step of an inquiry might look like (see Figure 1), and whether this was important.

To assist us to unpack this dilemma, this article explores two questions that helped us focus on the purpose of the “taking action” step. These questions are:

- What forms are student inquiry and integrated-inquiry approaches likely to take if they are located within a 21st-century learning frame?
- Do inquiry and integrated-inquiry approaches support students to engage in authentic study about real-life issues as suggested in *NZC*?

The 21st-century learning agenda of *NZC*

What messages are there about 21st-century learning in *NZC*? *NZC* describes itself as a “forward-looking” document. The section of *NZC* that discusses curriculum design and review suggests that each school’s curriculum should be designed to relate to students’ and communities’ needs and interests, and that students will be “addressing real-life situations” (Ministry of Education, 2007, p. 38). Four future-focused issues are offered as examples of potentially rich learning opportunities: sustainability, citizenship, enterprise and globalisation.

The *NZC* vision statement describes how the school curriculum aims to develop young people who are “creative, energetic, and enterprising”, and “confident, connected, actively involved, lifelong learners” (Ministry of Education, 2007, p. 8). For young people to fulfil this vision, they need to develop key competencies or lifelong learning capabilities through the school programme that enable them to “live, learn, work, and contribute as active members of their communities” (Ministry of Education, 2007, p. 12). The vision statement also suggests that, through their experiences at school, students will be enabled to learn how to be “active seekers, *users*, and *creators* of knowledge” (emphasis added, Ministry of Education, 2007, p. 8).

Thus a range of sections of *NZC* are aligned with ideas about 21st-century learning. These ideas place emphasis on students gaining a wide range of lifelong learning attributes and doing more than learning content knowledge as they engage in authentic and meaningful learning experiences. Twenty-first century learning ideas are expanded on in the next section.

Perspectives on 21st-century learning

It is important to note that 21st-century learning is not a set formula. Rather, it is an emerging set of principles and a “cluster of new ideas, beliefs, knowledge, theory, and practices” (Bolstad et al., 2012, p. 1). Many educators and commentators have offered different ideas about how education might better support students to develop the attributes they need in the 21st century. These commentators generally agree on the types of 21st-century learner attributes that need to be fostered, but have different reasons for why these attributes might be important. Some of these reasons and what they might mean for the school curriculum are discussed below.

One group of people who consider there is a need to change current approaches are educators such as Gilbert (2005), Bolstad et al. (2012) and Barron and Darling-Hammond (2008). Gilbert (2005) suggests that the shift from the industrial age to a 21st-century view of knowledge is a major challenge to the education system because it gives knowledge a new meaning. Rather than being seen as a thing that is developed and stored by experts, knowledge is increasingly being viewed as a process and is valued for its “performativity”; that is, its ability to “do things” (Gilbert, 2005). Thus old forms of stored knowledge are not an end in themselves, but are a “resource students will need to generate new knowledge” (Gilbert, 2005, p. 36).

Another perspective comes from business and industry leaders who are attempting to influence the education sector to ensure that it produces the knowledge workers of the future. Barron and Darling-Hammond (2008) note that recommendations from a range of industry leaders suggest that students need to be supported to acquire 21st-century learning skills through learning experiences that: explore real-life situations and problems; offer opportunities to gain media literacies and critical thinking skills; and develop the interpersonal and self-directed skills that enable students to manage projects and use tools.

Gilbert (2005) considers that knowledge-based societies value non-traditional work-related attributes such as an understanding of diversity, the ability to innovate, and creativity. Therefore, as noted in *NZC*, these are among the attributes we need to foster. Gilbert suggests

that one way schools can do this is through developing new frameworks for, and approaches to, curriculum and pedagogy that enable all students to have opportunities to take action on real-world problems.

These opportunities give schools a way to incorporate recent research about how people learn. New understanding suggests that people do not learn well if they are seen as “spectators” who are passive recipients of small bits of pre-packaged knowledge (Bolstad, et al., 2012). Instead, students need to be supported to actively engage in the “whole game” of learning (Perkins, 2009). Similarly, Barron and Darling-Hammond note that there is a growing body of research which indicates that “students learn more deeply and perform better on complex tasks if they have the opportunity to engage in more “‘authentic’ learning” (2008, p. 12).

Health and environmental educators also want students to develop the ability to innovate, be creative and understand diversity, but they have a different motivation. They see students developing *action competence* (i.e., the ability to engage in critical thinking and take action to support individual or societal wellbeing) to make sure that society is ecologically, socially and economically sustainable (Jensen, 2004). Like the other commentators, health and environmental educators also suggest that students need to do more than *learn about* an area. They also need to *learn for* their own or their societies’ wellbeing as they “learn by doing” or taking action to address environmental or health-related issues of concern to themselves, their local community or society (Jensen, 2004; Tasker, 2004).

Another set of ideas about 21st-century learning comes from complexity thinkers, some of whom are attempting to identify the practices that better support learners in our increasingly diverse society (Collins & Clarke, 2008; Davis & Sumara, 2006; Osberg & Biesta, 2008). Osberg and Biesta and Collins and Clarke suggest educators need to make more use of inclusive and “emergent” processes such as participatory democracy, which is about enabling collective decision making and co-construction in the classroom. Collins and Clarke consider these processes can support learners to *learn to be* in the world, which is in contrast to more traditional approaches to education that prioritise learners *coming to know*. They consider that inclusive and co-constructed processes result in an emergent curriculum which is more appropriate for a diverse range of learners because it enables teachers to connect to and access the different experiences, interests and understanding of a wider range of learners than those in the dominant culture.

By “emergent”, Osberg and Biesta (2008) mean that, rather than activities and interpretations being predetermined (e.g., when students conduct an

investigation or inquiry that has been pre-planned to work towards a known outcome), we need to use pedagogies that enable multiple meanings to emerge in the classroom. Collins and Clarke (2008) list many teaching pedagogies which they view as having a good fit with emergent processes, including curriculum integration and project-based learning. They suggest that enabling students to do activities such as redesigning the school playground is an example of an emergent and participatory learning experience.

Another group of commentators who consider we need to make more use of emergent processes is The New London Group (2000), who concentrate on approaches to literacy. They suggest we need a broader conception of literacy, which moves away from the 20th-century focus on one dominant language, printed text and a single interpretation of what a text means, towards a broader 21st-century exploration that also incorporates visual and oral literacies and provides space for the emergence of different viable interpretations of these new types of text. To do this The New London Group consider that literacy teaching practices need to make more use of democratic processes that acknowledge diversity. For example, teachers can draw on the different literacies that students bring to the classroom and make more use of the multimodal texts that students are now familiar with. The New London Group suggest these sorts of practices are likely to enable a wider range of student experiences, interests and interpretations to become part of learning experiences.

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(2005) cautions that we need to be careful that newer imports to the school sector, such as ICTs, are used not just to do “what schools have always done”; in this case, teach students information-gathering skills with the main purpose of accessing the existing knowledge of “experts”. Instead, she and Bolstad et al. (2012) argue that we need to adopt a future-focused approach that supports students to use ICT tools in 21st-century ways. One example could be using film-making as a tool to meet the learning goals of a project in a way that enables students to develop an understanding of, and make sense of, the way words, images and sounds interact.

What does this mean for how we frame inquiry and integrated inquiry?

To create teaching and learning environments that have a better fit with the demands of the 21st century, Bolstad et al. (2012) suggest that we need to find ways to coherently “re-bundle” or reorganise the multiple ideas and perspectives that come under the umbrella of “21st century learning”. Bolstad et al. (2012, pp. 3–5) identify six principles that are at the heart of this re-bundling. These are the need to:

- personalise learning (by moving away from one-size-fits-all models)
- develop new views of equity, diversity and inclusivity (which see diversity in all its forms as a resource)
- create a curriculum that uses knowledge to develop learning capacity (and equips young people to be able to *do things* with knowledge)
- rethink learners’ and teachers’ roles, away from the traditional roles of teacher and learner and the idea that the main purpose of school is to transmit knowledge
- develop a culture of continuous learning for staff
- develop new partnerships and relationships with the various communities schools are located within.

If we are attempting to align integrated and inquiry approaches with *NZC* and the ideas about 21st-century learning that underpin it, the six principles above, and the findings from other New Zealand Council for Educational Research studies, suggest that inquiry and integrated-inquiry learning experiences need to be framed in ways that:

- Address authentic or real future-focused concerns and issues that offer learning challenges and are meaningful both to students and to society.
- Use curriculum planning approaches that are participatory and emergent, and therefore are likely to be non-linear. (These processes enable all types of learners to be heard and to bring their experiences, ideas and suggestions to the table. It is important to note that

emergent does not mean solely *child-directed*, because the teacher has active roles both in scaffolding learning and in working with students to co-construct inquiries and integrated inquiries about meaningful big-picture concerns.)

- Use problem-solving, project-based approaches (which enable students or student teams to learn through taking action on these real or authentic concerns and issues and work with community members).
- Aim to support learners to learn to be in the world (while also having a sense of collective responsibility) as well as know and understand.
- Allow for meaningful integration across disciplines and subject areas, where necessary, while also using discipline-specific inquiry approaches to support students to see how knowledge is structured and accessed.
- Support students to learn how to learn (e.g., through scaffolding students to develop information literacy, and metacognitive, critical thinking and reflection skills).
- Use the tools (such as ICTs) of the 21st century in 21st-century ways (not just to access and store information).
- Enable students to take action or do something with knowledge (such as redesigning aspects of the school social climate or environment, or becoming involved in community projects). This takes students' learning beyond traditional types of action or reporting (such as writing reports or developing presentations or posters).

What does taking action involve?

During our visits to schools we noticed that the “using information” or “taking action” step of the inquiry cycle (see Figure 1) seemed to be something that educators were conflicted about. Some were unsure about what this step might look like or whether it was important (Boyd & Watson, 2006; Cowie, et al., 2009). A number of teachers perceived this step to be about students reporting their findings on individual projects to classmates or parents via traditional means, such as a report, poster or short presentation.

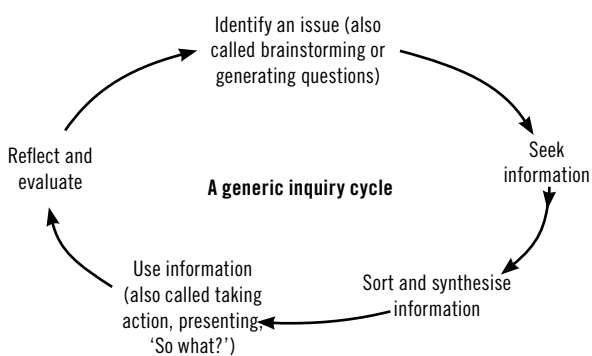


FIGURE 1. A GENERIC INQUIRY CYCLE

From a 21st-century perspective, taking action is a key part of the inquiry process and not an optional activity that may or may not happen at the end of a study. Taking action is about enabling students to use knowledge in a performative way through *making use* of their learning or *creating* new knowledge. From an environmental-education perspective, Jensen (2004) provides a helpful definition of what an action is. He considers activities such as an investigation into the pollution levels of a stream to be of value in assisting student motivation and the acquisition of knowledge. But he contends that such an activity only becomes a problem-solving action if it assists in providing a solution to a problem that students are working on solving. That is, this knowledge is *used in a new way*. An action that uses the knowledge stemming from a stream investigation could be students and teachers contacting local stream polluters to suggest ideas they have researched for improving the water quality in the stream.

If we apply Jensen's definition, reporting others' knowledge in the form of a poster or report is not using knowledge in a new way. Therefore this is not an “action”, in the appropriate sense, and is an example of a more traditional approach to learning. One approach that is aligned with Jensen's definition of an action is *democratic curriculum integration* (Apple & Beane, 2007; Beane, 1997). This approach aims to support teams of students to engage in acts of social justice through taking action to improve an aspect of school or community life. (For a more detailed description of this approach, see the companion article, Part A (Boyd and Hipkins, 2012).)

Across many studies, including those that explored the implementation of *NZC*, we have noticed a sector-wide increase in the opportunities provided to students to contribute and take action in ways that uphold more emergent and democratic processes. Some of these experiences are located within the curriculum programme. Examples include the “impact inquiries” designed by Albany Senior High School (Hipkins, 2011) and some Education for Enterprise and Education for Sustainability projects.

However, most examples of these types of activities are not a core part of the curriculum programme. The New Zealand data from the International Civics and Citizenship Study showed that students' opportunities to shape school life tended to most often occur as part of co-curricular activities such as cultural or sporting activities or through membership of school councils (Bolstad, 2012). Other examples of these activities we have heard about that sit outside the curriculum programme include: student teams that develop and/or manage school health and wellbeing initiatives such as active lunch-times or peer-mediation approaches (Boyd, 2009); and new

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roles for students as partners in restorative discussions. Experiences such as these provide many opportunities for students to use their knowledge and expertise to shape the culture of their school. They also enable students to develop a broad range of attributes and competencies. It is interesting to note that much of this change is happening at a co-curricular or school-wide level. Perhaps this is because ideas about classroom democracy clash with long-held beliefs about what students *should* know and what they *need* to know, as well as tacit beliefs about what students are able to offer (Bolstad et al., 2012).

Different models for different purposes?

So what does this mean for the types of inquiry and integrated-inquiry approaches that are used in schools? We have drawn a distinction between two different ways of thinking that appeared to underpin the approaches we saw in use (Boyd and Hipkins, 2012). These can be viewed as two ends of a continuum from “learners in action” to “learners in preparation”.

1. **Learners in action:** This interpretation of inquiry or integrated-inquiry approaches is underpinned by the idea that young people are *active citizens now*, who learn about participating in the world by actively modelling this in a school setting. Young people are supported to engage in projects that require them to use the competencies needed to create new knowledge. Thus, knowledge is seen as performative.
2. **Learners in preparation:** This interpretation of inquiry or integrated-inquiry approaches is underpinned by the idea that young people are *being prepared* for a future role as active citizens. To be ready for the future they need to develop the skills that enable them to seek and process knowledge, and understand how others use existing information to create new knowledge. They do not necessarily have to engage in the actual process of creating new knowledge themselves.

When inquiry or integrated-inquiry approaches encourage students to be learners in action, they make more use of emergent and democratic pedagogies. They prioritise learning situations that enable students to

work together and develop a wide range of attributes and competencies such as critical thinking and problem-solving. They also tend to require students to engage in learning experiences that draw on knowledge from more than one discipline, and to do something with the knowledge they have acquired. Therefore, for these reasons, the learners-in-action approaches appear to be more aligned with the emergent 21st-century pedagogies discussed above than the learners-in-preparation approaches.

The experiences from the *Curriculum Implementation Exploratory Studies* (Hipkins et al., 2011) and *Shifting the Frame* (Boyd & Watson, 2006), and our analysis of the texts written by education providers who have developed their own approaches, suggest that many forms of inquiry or integrated inquiry are often interpreted as supporting learners in preparation. This interpretation tends to result in a learning process that is more teacher-directed than co-constructed, and more aimed at supporting students to learn about content and develop information literacy skills as they engage in individual research projects. There is less focus on collective projects that create new knowledge through addressing aspects of real-life problems. Those who interpret inquiry or integrated inquiry this way are also more likely to pre-plan activities in the action step.

We noticed that this narrower learners-in-preparation framing appeared to be associated with the use of generic inquiry approaches. It is important to note that the information literacy skills that appear to be a core focus of generic inquiry approaches are one key subset of the skills and competencies that students require in the 21st century. However, if the whole emphasis is on learners in preparation, students will not be supported to develop the full set of skills and competencies they need for the future. Therefore, inquiry approaches to learning need to support students to do more than seek, process and present information.

Looking at the range of principles and characteristics of 21st-century learning experiences presented earlier in this article raises the question: Can the use of one generic inquiry approach accommodate all these characteristics? Those who advocate for integrated approaches to the curriculum tend to combine ways of working. For example, Beane (1997, 2007) and Dewey (1916) suggest a list of principles but do not suggest that particular learning or discipline-specific processes should be used: these are drawn on when relevant as a study emerges. Similarly, when discussing the impact of inquiry approaches on social studies teaching in New Zealand, Taylor, Urry and Burgess (2012) argue that inquiry processes need to be used in ways that maintain the integrity of the contributing disciplines.

The experiences of the schools we visited seem to suggest that a single generic inquiry approach may not be able to accommodate all the 21st-century learning characteristics suggested above. It may be more important to be clear which learning characteristics are being foregrounded and therefore scaffolded, and select an inquiry or integrated-inquiry approach only if it has a good fit with these characteristics. If the purpose is to start to develop students' learning-to-learn capabilities, such as information literacy skills, then an integrated approach to the learning areas supported by a generic inquiry model might be appropriate. However, if the primary aim of the planned learning is to support students to engage in study about future-focused issues, such as citizenship, this could lead to a range of possible options being co-constructed with students. One could be an integrated study, another could be a study that is primarily located within the health learning area (e.g., as students research, plan and implement a plan to improve the wellbeing of their class or school). This health-related study could be supported by a hybrid model, such as the action competence learning process (see Boyd & Hipkins, 2012). It could also involve activities that draw on discipline-specific processes, such as statistical inquiries. These processes could be framed in a way that enables students to find answers to authentic problems while also helping them to understand the nature of learning in the different subject areas.

All this suggests there is no one recipe for getting the balance right when accommodating all the characteristics of an emergent 21st-century curriculum within approaches to student inquiry and curriculum integration. The overall mix of approaches used will vary between schools. A mix of approaches, rather than a single generic inquiry model, appears important in enabling schools to create 21st-century learning experiences.

Preparing teachers for an emergent space

In a number of the schools we visited, teachers commented that they and their peers were at many different stages in their adoption of inquiry and integrated-inquiry approaches (Boyd & Watson, 2006; Cowie, et al., 2009). Some were enthusiastic adopters; others found using these approaches "too hard". Bolstad et al. (2012) suggest that a culture of continuous learning for staff is necessary to support the shift towards 21st-century practices, and many writers comment on the need to adequately support teachers as they start using new pedagogies such as integrated curriculum planning or inquiry approaches (Barron & Darling-Hammond, 2008; Beane, 1997, 2007; Dinham & Rowe, 2008). Beane

(2006) considers that teachers *and* learners need support so that they can be scaffolded into using co-constructed processes. Beane (1997) considers his approach to curriculum integration requires a paradigm or power shift to accommodate bottom-up planning processes. This requires educators both to have a set of beliefs that do not prioritise transmission teaching, and to let go of some of their ideas about curriculum coverage. Beane also notes that integrated approaches inherently politicise teachers and involve tensions and struggles as processes are negotiated. The shifts in beliefs that underpin all these changes are substantial, and it is important not to underestimate them.

As a result of these tensions, Beane (2007) observes that "democratic" teachers tend to operate in isolation or in pockets. We observed this pattern when we visited schools as they explored *NZC*. In some schools we heard about isolated inquiry or integrated-inquiry projects that students undertook, which appeared to be well aligned with 21st-century learning approaches. However, these projects tended to be one-offs and were not common practice across the school. We found that when we revisited schools some teachers had reverted to more traditional approaches. This suggests that these schools had not yet fully embedded the emergent principles discussed above in terms of the way they approached curriculum planning.

Increasing the focus on authentic and emergent learning experiences

Aside from the 21st-century arguments about the need to rethink how we see knowledge and our understanding of how people learn, studies suggest there are other key reasons why schools might want to increase their use of emergent and democratic approaches to curriculum and school decision making. Our experience across a range of projects is that when students are engaged in carefully crafted learning experiences that support them to address real issues—meaningful to them, their school community or the wider community—they tend to show a deep understanding of content, and increased engagement in and enthusiasm for their work. Students are also better able to identify how they gained a wider range of competencies, skills and knowledge (Boyd, 2009; Boyd et al., 2005; Boyd & Watson, 2006; Hipkins, et al., 2008).

Our and other studies also show that enabling students to be more active in setting directions is associated with a sense of enhanced wellbeing and connectedness to school (Boyd, 2009; Griebler & Nowak, 2012; Róiste, Kelly, Molcho, Gavin, & Gabhainn, 2012). In turn, an enhanced sense of connectedness to school

is associated with improved longer-term academic and health outcomes. This suggests that increasing the focus on emergent and democratic experiences is likely to have a wide range of benefits for young people that include—and go beyond—enabling them to be confident and actively involved lifelong learners.

What next?

This analysis of the framing and use of inquiry and integrated-inquiry approaches in schools suggests that some ways these approaches are interpreted or used are more aligned than others with the characteristics of 21st-century learning. These reflection questions are posed for educators to continue this debate in relation to the approaches in use at their schools.

REFLECTION QUESTIONS

What opportunities do we provide for students to engage in real-life projects about ideas or subjects that concern them and society?

What opportunities do we provide for students and teachers to co-construct the curriculum?

Does the way we are using inquiry and integrated-inquiry approaches provide a balance between students seeking and processing knowledge, as well as using or creating new knowledge?

How do we make use of discipline-specific processes within integrated and inquiry approaches? Is this done in a way that helps students to understand the nature of learning in different subject areas?

Further resources

For more information about 21st-century teaching and learning, see Bolstad et al., 2012 at: <http://www.educationcounts.govt.nz>

For more information about curriculum integration, see Apple & Beane, 2007; Fraser, 2000; Fraser & Deane, 2010; and Dowden, 2007.

For more information about inquiry approaches that link with ideas about 21st-century learning, see the Galileo site:

- <http://www.galileo.org/inquiry-what.html>
- <http://www.galileo.org/research/publications/rubric.pdf>

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