

# Literature Review

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R & C - Teaching and Research in the NZ Context: Teaching as Inquiry

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# Literature Review: How have 21st century skills contributed to effective teaching and learning?

## Introduction

The term, “21<sup>st</sup> Century Skills” refers to a skill set that is considered necessary in today’s society. The need for new skills has arisen due to the shift in the economies, from an industrial-based to an information-based one. Previously, schools have equipped students with a skill set that prepared them for a production-based workforce yet the literature suggests new skills are needed and have termed them, 21<sup>st</sup> century skills. This literature review aims to differentiate between the two skill sets to determine which skills are fundamental to success in the twenty-first century.

## Kaupapa Maori and Te Noho Kotahitanga

The purpose for this Literature Review is to acknowledge that there has been a shift in education and I want to find out how 21<sup>st</sup> century skills have contributed to this shift and what is needed to raise achievement for both Pakeha and Maori. The Kaupapa Maori research approach is about challenging norms to empower Maori views (Rangahau, n.d). While it could be argued that critical thinking and problem solving are not new to the 21<sup>st</sup> century they are seen as higher order thinking skills and may not be taught to all students. This review looks at ways of achieving a more equitable system where skills, which have previously been taught to the few, become the universal. Changes in the economy have meant individual and collective success depends on such skills and therefore schools must prioritise the teaching of these skills (Rotherham & Willingham, 2010).

## Findings

The major themes from the literature are.

1. Given the economies have changed and the workforce is radically different than ever before, a new curriculum/skill set is needed.
2. Simply “knowing things” is not enough, certain competencies are required.
3. Teacher professional development is needed in order to integrate 21<sup>st</sup> Century skills into their programs.
4. Assessment: How will 21<sup>st</sup> century skills be assessed?

## Comparative Review

### 21<sup>st</sup> Century Skills

A school's priority is to prepare its students for the future. However, schools are currently preparing students for a future that is not yet known, a future where the jobs have not been invented yet. Therefore if schools are to prepare students for such a future then new skills must replace the basic skills and knowledge expectations of the past (Binkley et al, 2012).

With the assistance of teachers, education experts and business leaders, the Partnership for 21<sup>st</sup> Century Learning (P21) developed a framework, which consists of knowledge and skills that will enable students to succeed in work and life (Partnership for 21st Century Skills, 2006). While there is still emphasis on the core subjects such as English, Reading, Mathematics, Science, there appears to be a shift in emphasis towards; global awareness, financial, economic, business, and entrepreneurial literacy; civic literacy; health and awareness and ICT literacy. Along with academic content, students need to know how to keep learning and therefore learning and thinking skills are essential to the framework. These skills include; communication, collaboration, critical thinking and creativity, all of which can be referred to as the 4Cs. (Partnership for 21<sup>st</sup> Century Skills, 2006). When compared with other frameworks, the Partnership framework fuses the 4Cs of twenty-first skills with the 3Rs of what could be called twentieth century skills; Reading, Writing and Arithmetic. There is still a connection between knowledge content and skills. It could be argued that this framework is still seen as an economic approach to education, whereas other frameworks, like the OECD competencies lean more towards a holistic approach of human ability (Ananiadou & Claro, 2009) and contextual skills as opposed to twentieth century curriculum content or economy (Dede, 2010).

Vavik and Salomon argue that there is still a need for a discipline-based approach and go on to differentiate between information and knowledge. In a 21<sup>st</sup> century approach, skills and competencies act as stand alone pieces of information whereas it is the construction of meaningful knowledge that is needed for a productive knowledge society (Vavik & Salomon, 2015).

## **Key Competencies**

“A 21st Century school must be responsive and flexible enough to ensure every young person can achieve their potential and is set up for lifelong learning” (p.21, Ministry of Education, 2006). The five key competencies that are identified in the New Zealand curriculum are the capabilities that one needs for living and lifelong learning (Ministry of Education, 2007).

In her book, Key Competencies for the future, Hipkins describes a framework where learning is centered on the student, where students share rich connections between what they are learning and their own lives. They can develop their own capabilities and take initiative in their learning. The book refers to, “Wicked Problems” which are highly complex problems that schools are not traditionally set up to solve. Such concepts require students to explore, inquire and take action in response to a problem (Hipkins et al, 2014). Such an approach is dramatically different to a knowledge driven, passive environment seen in 20<sup>th</sup> Century education systems.

David Perkins offers a noteworthy insight when he invites readers to reimagine education and seek out what one considers being “life-worthy learning”. In his book, Future Wise, he balances the need

between content knowledge and skills, ultimately you need content to practice skills but he suggests the focus is to shift from output to a focus on process (Perkins, 2014).

## **Teacher Professional Development**

In this shift from 20<sup>th</sup> Century education to 21<sup>st</sup> Century education, the perception of teachers has also shifted. They have gone from the “sage on the stage”, the central figure that has the knowledge to which he transmits to the student, to the “guide on the side” where their role is to facilitate the students own construction of knowledge (King, 1993). As identified by King, such a view of teaching practice is outdated and no longer effective in the 21<sup>st</sup> Century (King, 1993). If teachers are to meet the needs of 21<sup>st</sup> century learners then they need to re-evaluate their teaching practice and see themselves as their students, like learners (Bull & Gilbert, 2012). A way this can be achieved is through professional development and providing teachers the opportunities to learn from each other. The Leading Learning project was developed for teachers to work together in “communities of practice” in which they could develop their own learning capacity (Bull & Gilbert, 2012).

Key findings from the OECD countries found that there were few teacher-training programs that targeted the development of 21<sup>st</sup> Century skills. The findings were also in agreement with Bull & Gilbert’s findings and added that teachers mindset around the value of these skills would need adjustment (Ananiadou & Claro, 2009).

A mindset that Perkins addresses is the attitude around teaching thinking skills. Evidence suggests that skills won’t be learnt simply through osmosis and that these concepts need to be explained, put into action and revisited. Generally, teachers have left thinking until the end of a lesson, yet Perkins encourages teachers to take an active approach and constantly question students’ thinking (pg. 208-211 Perkins, 2014).

## **Assessment**

21<sup>st</sup> Century Learning Design developed learning activity rubrics to assist both teachers and learners in an attempt to develop student skills for the 21<sup>st</sup> Century. These rubrics are comprehensive and practical to follow. They cover six areas, all of which are highly regarded as appropriate 21<sup>st</sup> Century skills (21CLD, 2012).

It is widely recognised that learning needs to be personalized and students are to learn “how to learn”, yet types of assessment are predominately summative, focusing on outcomes to increase national standards instead of focusing on formative assessments that strengthen students as learners (Deakin Crick, 2007). One way of transforming assessment is through Deakin Crick’s Effective Lifelong Learning Inventory (ELLI). The purpose of the inventory is to develop student self-awareness by taking ownership of their learning and self-assessing.

Key findings from the OECD countries found that there were no official assessment policies for 21<sup>st</sup> Century skills even when New Zealand saw such capabilities as integral to teaching and learning and should therefore not be separated, that they should in fact be using competencies as forms of

assessment (Ananiadou & Claro, 2009). This is not surprising as Hipkins, author of Key Competencies for the future, advocates that key competencies should not be assessed. However there is certainly a need for recognition of such competencies. The current structure of assessment will not work as these tasks are complex, often cross learning area boundaries, authentic and personal to each student, in which such an outcome may not be pre-determined by the teacher (Hipkins et al, 2014). Given that 21<sup>st</sup> century skills enable life-long learning then assessment must rely on the learners' self reflection and Hipkins proposes portfolios could be useful.

Another framework for assessing 21<sup>st</sup> Century skills is the, "Constellation of Learning" developed by Douglas Reeves. The framework involves five core areas that can be adapted across any learning area. These areas consist of; Learn, Explore, Create, Understand, Share. This framework combines critical thinking, problem solving, teamwork, creativity and assists real-world problem solving, proving far more useful than passing a test (Reeves, 2010). His model incorporates the 4Cs of 21<sup>st</sup> century learning and is similar to Inquiry models being used in New Zealand schools.

## Gaps in Available Research

While the research was inspiring and certainly relevant to what I observe in my classroom, I feel the research did not go into depth about how teachers can be sure that foundational skills, such as reading and writing will be taught. I can see the benefits in an inquiry, student driven approach and feel able learners will thrive in such an environment, but how do teachers support less able students? If a student has a low reading comprehension, how are they expected to master the 21<sup>st</sup> century higher order thinking skills without first learning how to read? For my own teaching as inquiry, I want to look into how teachers scaffold their learners in a 21<sup>st</sup> century environment, especially within BYOD classrooms where it is assumed students can find information on their computers and understand it.

## Contrasting Opinions

*If a 21<sup>st</sup> century classroom is student-centered and students are to inquire into areas of interest to them, then won't they be limited by their own life experiences?*

I begin to question my role as a teacher when I think of a student centered classroom. I have always thought my role was to expose students to a range of learning content and ideas, yet if they co-constructed the curriculum, as proposed in a 21<sup>st</sup> century environment then I wonder whether students will choose differing areas or whether they would stick to what they already know. Having read, Supporting future-orientated learning and teaching, I am beginning to see how the development of key competencies and co-constructing knowledge can build a foundation for students to explore content areas (Bolstad et al, 2012).

*If teachers are to assess students through portfolios and self-assessments, how do they report such data back to the Ministry of Education? How are teachers held accountable for student learning?*

While the alternative forms of assessment look appealing, the research did not go into depth about how teachers would be expected to report progress to Board of Trustees or Ministries.

## Conclusion

Research suggests that the education systems of the past are no longer relevant and that a transformation is required. It can be seen from the research that if students are to be prepared for the future then they require a new skill set, one that goes beyond knowledge and basic skills. Students will need to become problem solvers and creative innovators in order to succeed in the 21<sup>st</sup> Century. For this to happen, schools need to bring key competencies to the forefront as well as provide rich engaging content that is relevant to the students' lives. One should not replace the other but they should integrate and be entwined within the curriculum, even if that means spreading across several learning areas. Naturally, teacher preparation and training needs to incorporate 21<sup>st</sup> century pedagogies as well as provide professional development opportunities for current teachers. There are several factors affecting the implementation of 21<sup>st</sup> Century skills, however rethinking the way we view education is needed and alternatives for assessment are essential. The research has identified how education is no longer about attaining knowledge and that its purpose now is to develop the skills to work with the abundance of knowledge.

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