



Co-Design for Curriculum Planning (CDCP)

**A white paper on the co-
design approach to
developing teachers’
21st Century skills**

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Executive summary

There is a rare consensus in educational policy around the need for students in Australia to learn 21st Century skills. The National *STEM School Education Strategy*, the Queensland *Advance Education* strategy and the new ACARA *National Australian Curriculum* all recognize the need for students to learn the skills that will allow them to thrive in a rapidly changing, highly technological world.

Yet there are currently limited opportunities for teachers to develop their capacity to teach these 21C skills. The *Co-Design for Curriculum Planning* (CDCP) approach was developed through a 2017/18 Queensland Department of Education and Training (DET) Education Horizons grant, *Scaling up Queensland teachers' capacity to teach creativity and innovation: Piloting Design Thinking in Digital Technologies*.

CDCP uses a Design Thinking approach to partner with schools, using workshops and joint curriculum planning as a form of professional development.

By experiencing the design process during curriculum planning, teachers gain the confidence to use the design process in their teaching

This white paper aims to communicate the current quality of evidence supporting the CDCP approach, as it has been used in the context of the *ACARA Digital Technologies Curriculum*. This paper describes:

- The **key features** of the CDCP approach as piloted in two Queensland schools
- Selected **teacher comments** from the pilot in 2018
- An overview of the **impact, scalability and costing** of the approach
- The **significance** of the approach and the **research directions** required to improve the quality of evidence supporting CDCP

Key Features of CDCP

The rationale for CDCP is that teachers who have adopted the process, skills and mindsets of design thinking are teachers who are better able to plan, implement and assess 21st Century skills¹.

- The **metacognitive skills required** for design thinking are essentially the same as those defined as 21st Century skills—the ability to self-assess, to reflect, and improve one’s own learning strategies—in order to share, to think, and to co-create in a changing world²
- There is **strong evidence for design thinking** following decades of research in design science. There is evidence of successfully applying design thinking in many different professions, including teaching³.
- There exist well established and widely used **frameworks, tools and approaches for running design thinking immersion workshops or K-12 classrooms using design thinking**, that have yet to become broadly utilised across the teaching profession⁴.

The CDCP model can be visualised as a process, Figure 1. An organisation phase obtains support from school leadership and identifies teachers. The curriculum design phase centres around co-design workshops, with curriculum planning of a term of work as the object of design. There is a sustained partnership during teaching, and for reflecting and sharing with other schools after the term.

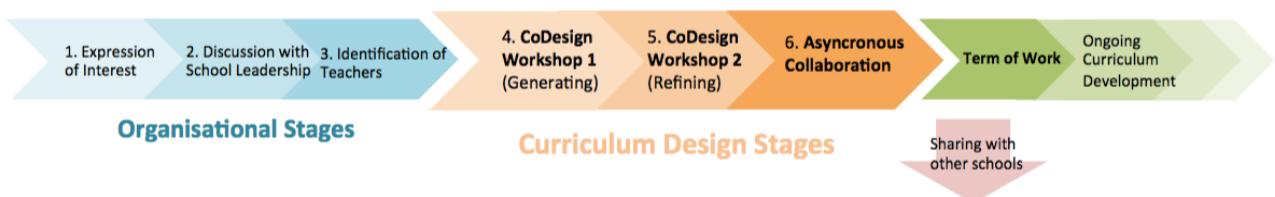


Figure 1 *The co-design for curriculum planning model within each school*

¹ See for example the foundational work of Goldman et al. (2012) and the maturation of this rationale in Koh, Chai, Wong, and Hong (2015).

² A comparison of different frameworks for 21st Century Skills is provided by Dede (2010) and is in keeping with the QCAA definition of critical thinking, creative thinking, communication, collaboration, personal/social skills and ICT skills.

³ See for example the description by Wright and Wrigley (2017) for how design-led educational innovation is brought about by teachers who develop the knowledge, skills and mindsets for design thinking.

⁴ For example, the Stanford d.school suite of tools or the Cooper-Hewitt design thinking resources.

In the Education Horizons project *Scaling up Queensland teachers' capacity to teach creativity and innovation* the focus was upon the use of co-design for curriculum planning for the **ACARA Digital Technologies Curriculum** (Digitech). This subject is a suitable choice for piloting CDCP, as it forms an important part of the national STEM agenda and is a subject for which many teachers are still developing their technological and pedagogical content knowledge.

There is theoretical reason to believe that there will be a **triple benefit** for teachers taking part in CDCP activities through:

1. Teachers **experience design thinking immersion workshops** and thus have a model to visualise design-led pedagogy. The CDCP team has years of experience in writing school curricula and in teaching university level design studios.
2. In the CDCP process teachers work to design their teaching for future terms; through co-design, the CDCP team can ensure that **student engagement** remains a key criteria for successful learning design
3. **Students benefit** both through considered learning sequences spanning a whole term of work, and through teachers who have confidence in their competence to plan, implement and assess project-based learning.

The research team worked with two Queensland schools to pilot the CDCP approach. This involved:

- Co-designing a term of Digitech work with each school (for Year 9) through the process in Figure 1
- Interviews with teachers and school leaders to determine perceptions regarding the value of the approach
- Developing a toolkit to support CDCP involving resources for teacher activities, OneNote templates, and instructional videos.
- Developing two websites, to inform other schools and policy-makers about the approach and to support teachers who have completed the CDCP programme.
- Developing a prototype survey instrument that diagnoses a teacher's confidence and implementation of teaching for 21st Century skills⁵

⁵ Following the work of Ravitz, Hixson, English, and Mergendoller (2012)

The approach is designed to work entirely online to facilitate the participation of regional and rural schools across Queensland. For this reason, the second school in the pilot was in a regional area, and the CDCP workshops and collaboration was conducted “at a distance” to test the efficacy of this approach.

Read the journal paper with full description of pilot study (draft):

<https://www.codesignforcurriculumplanning.org/outcomes>

Through working alongside teachers as they design curriculum plans for future terms (one of the most important activities of their professional work), the approach has many flow-on benefits for schools, teachers and students, such as:

- The research team **facilitates the authentic sharing of knowledge between schools**. Teachers in School B define their learning goals, and the research team can inform them about what School A has done that might help them.
- The research team **connects teachers with government initiatives** that they may only know about in the abstract. For example, to free workshops being run in their area or to online resources that will be helpful to their context.
- The research team **models the use of OneNote** during collaboration with teachers. In both schools, teachers spoke of OneNote now being used in other subjects, and in one school, now being adopted school-wide.

Teacher comments from the pilot study

Certain teacher comments from interviews help to provide a picture of how the CDCP model was perceived within schools.

- Teachers appreciated that CDCP helped them to focus upon ways to get students engaged with the learning through student-centred design

“[CDCP] is really getting to the core and the heart of what we as teachers want to do better, which is make sure that we have full, 100 per cent attention in our classrooms and our students are engaged with what we're teaching” (Deputy Principal)

- Teachers appreciated the authentic nature of the collaboration, that it was not PD in addition to their work, but rather PD that helped them to do their work

“...as we worked with [the CDCP team] through the workshops and had meetings and shared resources and saw the wonderful work that was happening, then teachers really bought into it because they could see the direction it was going in” (HoD)

- Similarly, teachers also appreciated that the project-based learning was giving students an authentic context for their learning. Students could bring their own experiences to the assignment.

“I really liked the design thinking because I like implementing a context to something. I think students really get or understand something better when they realise they can use it in real life” (Teacher)

- Teachers gained a lot of confidence from being connected in to the network of resources and support for Digitech. The teacher described a transformation through CDCP and learning from the team about where to look when he had a problem.

“I think that would probably be the greatest asset of this whole process is my much greater capacity to problem solve” (Teacher)

Impact, scalability and costing of the approach

The Queensland Department of Education and Training has developed an **evidence framework** for assessing the standards of evidence that support an intervention⁶. This has four dimensions of design, impact, scalability and investment.

- The pilot study has allowed the **design** of the CDCP to reach the level of *possible attribution* (i.e., that positive impact observed is due to the intervention) by clearly documenting the approach and its outcomes from two schools, and by publishing the theoretical rationale.
- The **impact** of the approach is *high*, but the measurements have only been qualitative to date. A shift towards quantitative results are needed to understand the measurable benefits of the approach
- The **scalability** of the approach is currently *well* documented but requires further implementation across more schools to ensure that the positive outcomes will generalise to different school contexts.
- The **value** of the approach in terms of cost per unit of measurable outcome requires further study. However, the pilot study has suggested that the cost currently comes to approximately \$12,000 per school⁷ with an estimate that this can be reduced to approximately \$6,000 per school through identification of efficiencies that can be realised through further development.

The CDCP approach brings in extra value that has not been costed, through its role in multiplying the value of existing approaches. For example, money that is spent on online resources or on workshops gains greater value with a CDCP team directing teachers to these resources as and when they are needed.

⁶ <https://qed.qld.gov.au/publications/management-and-frameworks/evidence-framework>

⁷ Note that this refers solely to the cost of implementing CDCP in a school in terms of teacher relief, human resources and consumables—it does not include the cost of the research required to further develop and refine CDCP.

Current and future research directions

The significance of the research, as demonstrated in the pilot, is that:

1. **Teachers** develop knowledge of the Digitech curriculum content; knowledge about how to use technologies for that curriculum in an authentic and situated context (e.g. instead of learning about coding they learn *how to code for a particular project that they want to set their students*); and pedagogical knowledge about how to teach in a way that facilitates student acquisition of Design Thinking process, skills and mindset for 21st century skill development and life-long learning (e.g., by applying the toolkit and techniques that have been modelled for them by the CDCP team).

A secondary but significant benefit is that *teachers feel more supported in their work*. Intrinsic motivation for a job occurs when an individual feels that they have the *autonomy* to do the job in harmony with their beliefs; become *connected* to other humans through the work; and feel that they have the *competence* to successfully complete it (Self-determination theory; Ryan & Deci, 2000). Through CDCP all three of these areas come to be present within curriculum planning—where often they are not.

2. **School culture** shifts through a *group* of teachers who are proponents of Design Thinking, and who have the tools (e.g. the toolkit, OneNote skills) and mindsets for implementing it. In the pilot this led to spillover, with other teachers and other subjects adopting OneNote and a Design Thinking approach.
3. **Inter-school and government-to-school** knowledge-sharing is given a huge boost through the approach. Each time that the CDCP team works with a school they add to a portfolio of approaches that they can share with teachers in future schools. The team also ensures that knowledge is effectively re-used, by connecting teachers to related online resources or government programs, in the authentic context of curriculum planning for a term of work.

However, future research is needed to make the approach more scalable and to raise the quality of evidence supporting the approach. The research team proposes that this can be achieved through:

- Extending the pilot study to cover 16 schools, the majority in regional and rural areas, to ensure the generalisability and contextualisation of the approach, and to refine the methodology and materials.
- Developing the research required for measuring students' capabilities for 21st Century skills. Without this kind of strong evidence base, it is not possible to measure the impact of upskilling teachers through design thinking.

***Outcomes from the project are available on our website:
<https://www.codesignforcurriculumplanning.org>
Includes samples from the workshop toolkit, teacher artefacts
and student work developed during the project.***

References

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