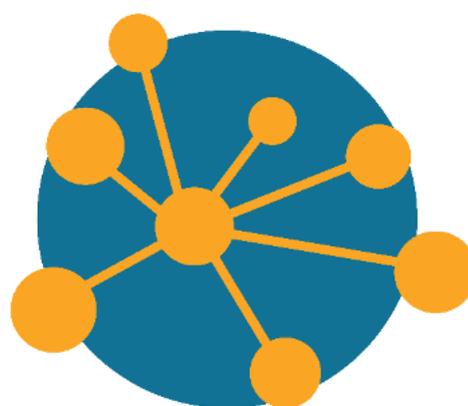


Digital Technologies in focus:

Supporting implementation of Digital Technologies



St James
Catholic College
Tasmania
Final project report

DIGITAL TECHNOLOGES IN FOCUS FINAL REPORT	
School name	St James Catholic College
School team members	STEM Teacher and ICT/Digital Technologies (DT) Key Teacher 1. Class Teacher 2. Deputy Principal 3. Class Teacher
School profile	Number of students <300 Location Provincial Sector Catholic School type Co-educational Year range K–10 Proportion of students who are Indigenous: 37% Proportion of students with disability: 16% Proportion of students who have EAL/D: 0%
Year level(s) involved in project and reason for choice	Years 3 / 4/ 5 / 6 <ul style="list-style-type: none"> • We required further integration of the curriculum into kitchen/garden. • To develop leadership opportunities for the Year 5 and 6 students • These students have kitchen and garden classes on a Friday • The Year 3 teacher, at the start of the project, identified the need for additional support with ICT and DT implementation. • The Year 4 teacher was in her first year of teaching after graduating from university last year. She is eager and motivated and we worked to support her with this new curriculum area.
Number of students involved	At the beginning of the project: Year 3 = 13 Year 4 = 24 Year 5 = 16 Year 6 = 19 Total = 72 At the end of the project: Year 3 = 16 Year 4 = 13 Year 5 = 16 Year 6 = 22 Total = 67
No. of teachers involved	6

INVESTIGATING AND DEFINING

Research question

Linked with the Stephanie Alexander Kitchen Garden (SAKG), how can primary teachers at St James Catholic College develop efficacy in teaching the Digital Technologies curriculum to assist students to be regional and global citizens capable of active and ethical communication and collaboration, with skills in computational and systems thinking?

How has the research question evolved over time?

The research question changed drastically. We adjusted the focus from what students would do and achieve in a product, as it was identified that a more authentic focus was on what the school intended for students to learn and be skilled in doing. We also reduced the link to the garden as we simply needed more time to upskill students with the basics and they required very little additional motivation to engage with the Digital Technologies curriculum.

How has your understanding of the question evolved over time?

We have developed our understanding of the various elements of the question through our increasing understanding of the related vocabulary and deepening understanding of the specific curriculum content. We have a far better understanding of the skills that are unrelated to the traditional idea of 'technologies' as simply ICT.

Aims: Reflection

Have the aims changed? If so, how and why?

The aims of the project changed up until this year. Our final aim was to focus on teaching students to find digital solutions for problems and for these solutions to be transferable to other contexts.

The original aims focused too heavily on incidental outcomes related to the garden that were only intended to be the motivating link for students.

Research

If you conducted research describe it.

We contacted and/or collaborated with the following through various opportunities and webinars:

Huonville High School – Nel Smit, Environmental Educator

Clarendon Vale Primary School – Trudy Ward, Year 3/4 teacher – have a garden and men's shed

Our Lady of Mercy Catholic School, Deloraine – Mary Wall, Principal – received the Digital Literacy Grant. Garden project.

ACARA – Peter Lelong

TCEO – Joseph Pearson, Education Officer

We used our school's professional learning ecosystem as necessary.

We used the following resources to research and access resources:

- Digital Technologies Hub
- student and staff surveys
- data from the Bebras Challenge
- formative and summative assessment as part of the Digital Technologies teaching and learning cycle.

How has your project improved implementation of the Australian Curriculum: Digital Technologies?

- Improving teacher confidence and dialogue surrounding DT
- Beginning to bring student skills and understandings up to the appropriate level
- Providing funding and focus for valuable teacher release for planning and professional learning (PL)
- Creating an emphasis on resources, PL and sharing of knowledge
- Initiating the development of new units of work for DT
- Increased teacher and student interest and motivation to improve at the DT curriculum
- Providing networking opportunities to share ideas and seek support
- Building potential lasting relationships between schools and teachers with strong opportunities for collaboration

Criteria for success: Evaluating

Comment on progress against each criteria for success.

- We are aware of schools with similar aims and contact was made/maintained throughout the project. We have other potential collaborations arranged for 2020.
- Data were shared between schools through the webinars. This included stories of successes, failures and activity ideas.
- Teachers engaged with relevant PL and shared their knowledge within the team.
- Students collected, analysed and interpreted data throughout the process
- All students in primary were guided to identify problems, suggest solutions utilising digital technologies, and attempt the solutions.
- We ordered, became familiar with, and used technologies that support the teaching of the Digital Technologies curriculum, including micro:bits, Edisons, Lego Mindstorms EV3 and Bee-Bots.
- We collaborated to complete quality teaching and learning cycles to collect student data of progress against the Australian Curriculum standards and monitored progress through curriculum planning, assessment, and preparing for reporting.
- All planning for Digital Technologies that has been developed since the beginning of this project is available to all staff on our shared drive.
- The STEM teacher uploads photos of classes and lessons/learning tasks to our shared drive for other teachers at the college to view.

GENERATING AND DESIGNING

What actions/steps were undertaken?

- Completion of a project timeline and professional networking ecosystem
- Teacher PL opportunities and release sessions for team collaboration
- Teacher planning sessions facilitated by Joe Pearson/Peter Lelong
- Teacher Professional Learning Team sessions focusing on Digital Technologies unit development
- Garden teacher and class teachers worked with students to identify problems, generate solutions and collect data
- Working with the STEM teacher on a plan to keep teachers involved with DT development
- Working with the STEM teacher to support her in her leadership of this area to further grow the sustainability of DT in the college
- Further development of unit plans and increased integration
- Allocation of funds and continued development of relevant resource collection

What were the effects of these actions?

- Teacher professional learning opportunities
 - Prioritised funding and sent several staff to PL
 - Sent the STEM teacher to various relevant PL opportunities. She then brought this expertise back and applied it.
- Teacher planning/training/networking sessions facilitated by Joe Pearson/Peter Lelong
 - Multiple sessions and in-class demonstrations
 - Use of the Lending Library resources
- Teacher Professional Learning Team sessions focusing on Digital Technologies unit development
 - Collaborative planning resulted in multiple quality units being developed, refined and followed.
- Garden teacher and class teachers worked with students to identify problems, generate solutions and collect data.
 - For example, students developed websites accessed through QR codes displayed in the garden to share important information about plants in the garden. They considered the problem, the solution and the appropriate user interface/accessibility.
 - Students collected soil moisture data and used this data to make decisions.
- Working with the STEM teacher on a plan to keep teachers involved with DT development
 - Finding/developing first followers
 - Increasing and spreading leadership roles
 - Increasing sustainability of DT
 - Focusing on evidence and assessment rather than content familiarisation
- Further development of unit plans and increased integration
 - Supporting teacher capacity
 - Increasing ease of access to resources and information
- Allocation of funds and continued development of relevant resource collection
 - e.g. 10 Bee-Bots with Earn and Learn Points
 - Associated picture books (e.g. Hello Ruby, Rosie Revere Engineer)

To what extent have the proposed actions been implemented?

Staff have an increased understanding of the DT curriculum and how to teach and assess it. We have numerous unit plans available for staff to access on the team drive. The STEM teacher has taken on a leadership role and is meeting and collaborating with the class teachers to support meaningful and authentic integration. This was vital for ensuring the sustainability of the leadership of this curriculum area as we further develop staff confidence and capacity. The planning, networking and professional learning sessions were successful and contributed to increased teacher efficacy in improving student outcomes in Digital Technologies. We successfully gained multiple grants and prioritised funds for the required resources. These were carefully selected based on a cost-benefit analysis. We also took advantage of retail promotions, such as the Woolworths Earn and Learn promotion, to get free resources.

We improved teacher confidence through training and dialogue surrounding Digital Technologies and Digital Literacy, the associated curriculum, learning tools and resources available (e.g. Digital Technologies Hub).

We exposed relevant staff to the vocabulary of digital technologies and digital literacy (e.g. computational thinking) and provided support for understanding key terms. CSER MOOC was helpful for this.

Students have been highly motivated and self-directed in their exploration of new resources and some students, teachers, teacher's assistants and parents chose to attend Code Club sessions after school. Students are engaged in their learning in Digital Technologies lessons. Teachers began to bring student skills and understandings in digital literacy up to the appropriate level for their year level in school and bridged the gap for the older students who were starting from a rudimentary understanding. Teacher confidence came from the evidence of student improvement, through formative and summative assessments against the Australian Curriculum Achievement Standards, because of their explicit teaching and learning activities.

Were there any challenges which arose in negotiating actions with others, or in negotiating time and resources?

- Scheduling time for all primary teachers to sit with the STEM teacher for a double period of 2020 planning
- Funding for 2.5 days of a relief teacher
- In future, will allocate at least double that amount when setting the budget
- Keeping DT relevant for all staff with current structure
- Out of sight, out of mind
- Providing opportunities for collaboration and class sharing
- Connections with other schools
- Time factor
- Being at a small school and 'wearing many hats'

What were the intended and unintended effects of your actions? Explain why they may have occurred.

- Gradually improved student outcomes due to increased exposure and increased staff efficacy
- Increased staff interest in the subject area due to increased conversations and training opportunities
- Increased teacher efficacy in the subject area due to the professional development and repeated exposure
- Increased parent and student interest in the subject area due to opportunities for involvement such as Code Club and classroom lessons. This was not an initial aim of our actions.
- Increased funding allocation for the subject area after increased discussions among leadership and the inclusion of STEM as a system priority
- Lending of resources to another nearby Catholic school after increasing conversations and successful efforts to improve our resources for the subject
- Increased access to units of work through development of units with the PL teams
- Increased engagement of students with Digital Technologies who were, at times, disengaged with other curriculum areas
- New staff members stepped up to take increased ownership of the Digital Technologies area and became emergent leaders.

Data collection: Evaluating

What strategies are being used to collect data and monitor progress?

- Pre and post surveys of staff
- Student assessment results
- Units of work developed by teachers and professional learning teams being stored on Team Drive
- Observations by teachers, including recordings, and annotations
- Work samples and annotations taken by teachers

Were there any ethical problems which arose in negotiating access to, and release of, information? How was this resolved?

No, none were encountered.

COLLABORATING AND MANAGING

Resources

Identify the resources used in the implementation of the project.

- Time: costs associated with the time for teacher release, planning, meetings, training, PL
- Staffing: Deputy Principal, class teachers, ICT/DT Key Teacher, STEM Teacher
- Technology: laptops, iPads, Bee-Bots and accessories, Edisons and accessories, Lego, consumables (e.g. tape, paper), micro:bits and associated components
- The Lending Library
- CSER MOOC Foundation Course and Extended Course
- Digital Technologies Hub and similar online resources
- CS Unplugged
- Picture books (e.g. Hello Ruby)
- Grok Learning
- Scratch Jr

Challenges

If there were challenges, what were they and what were the causes?

We revised some milestones and deliverables. While units were developed, and implemented on time, the reporting dates were pushed back. This was a decision made by the system.

How have you handled these implementation challenges?

We gave details of progress in student reports but without a grade. We did have enough data to give an A–E grade but ultimately the students will have benefited from the delay in A–E reporting.

Milestones and deliverables

Provide revised milestones and deliverables for the sustainable implementation of Digital Technologies in your school.

By end of Term 4, 2019: Host planning integration meetings between classroom teachers and the STEM teacher

By end of Term 4, 2019: Refine the curriculum overview for Digital Technologies and finalise the revised scope and sequences across the primary school.

Terms 1–4, 2020 and beyond: Continue to refine and add to the collection of unit plans developed so far.

Term 1, 2020: Continue Code Club with the interested staff members and students.

Terms 1–4, 2020: Professional learning focus on data (i.e. types, representation, interpretation, analysis)

PRODUCING AND IMPLEMENTING

Describe how Digital Technologies is being implemented in your school.

For various reasons, implementation of Digital Technologies has changed this year and is being taught as a specialist lesson by a specialist teacher. Each class has a weekly lesson or double lesson, from Prep to Year 6. Integration with other subject areas is occurring through collaboration with class teachers. Implementation is likely to remain this way in 2020 and planning meetings have occurred to provide maximum opportunities for successful and authentic integration of other STEM areas.

How does this differ from your original plans? What contributed to this change?

Originally, Digital Technologies was being taught in class by each classroom teacher. Changes in staffing and release time for teachers also contributed to the decision to elect STEM as another release/specialist subject. The skills and passion of the staff member fulfilling this role was also a determining factor.

If you intend making further changes to your implementation plans, please describe.

Not for 2020

EVALUATING

Evidence of student engagement

There are various images of students engaging in Digital Technologies in classes but also in their lunchbreak and after school in Code Club. Students choosing to spend their free time on endeavours directly linked to the Digital Technologies curriculum is a testament to their engagement and interest in the subject area. Their focus, positive behaviour and participation in lessons has been impressive. Students are persisting with challenging problems introduced to them in line with the Digital Technologies curriculum and are highly motivated to improve.

EVIDENCE OF ACTION RESEARCH ACHIEVEMENTS

- Teacher unit plans
- Team Drive: units available
- Photos and student work samples
- 100 per cent of staff surveyed found the DTiF project beneficial and supportive

Next steps

What goals do you need to set as the next step as you work towards achieving sustainable implementation of Digital Technologies in 2020–23?

	Action	Who?	When?	How?
Short term	Planning integration meetings between classroom teachers and the STEM teacher	Class Teachers Deputy Principal STEM Teacher	End of Term 4, 2019	DP to schedule and communicate times <i>STEM/class teacher to have blank curriculum overviews prepared and an idea of opportunities for integration</i>
	Refine the curriculum overview for Digital Technologies and finalise the revised scope and sequences across the primary school	Deputy Principal STEM Teacher	End of Term 4, 2019	Schedule a time to meet <i>Bring current documents and review/revise and update</i>
Mid term	Continue Code Club with the staff who expressed interest in facilitating and invite students	Deputy Principal STEM Teacher Volunteer teacher(s)	Term 1, 2020	Seek expressions of interest in Term 4, 2019 Have volunteer teachers commit to a starting date <i>Share resources</i>
	Professional learning focus on data (i.e. types, representation, interpretation, analysis)	Classroom teachers Leadership STEM Teacher	Terms 1–4, 2020	Schedule at least four PL opportunities for all staff prior to Term 1, 2020 Create the relevant PL overview Contact relevant presenters Prepare relevant PL
Long term	Continue to refine and add to the collection of unit plans developed so far	Classroom teachers STEM Teacher Deputy Principal	Ongoing	Deputy Principal to provide clear guidelines for the curriculum documents and to provide feedback and support STEM teacher to collaborate to develop units

Thank you for your time and commitment to the Digital Technologies in focus project.