Design Thinking is the Driver

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“Innovation drives improvement, either incrementally by advancing existing processes or more radically by introducing new practices” (OECD, 2014, p3). Westbourne Grammar School has slowly been advancing existing processes by introducing new practices through experimenting with design thinking in the years 3 -6 space (Verdon Centre). Design thinking is not a new concept and is used globally when dealing with complex problems where teams are faced with varied challenges. It often comprises of collaboration through finding and processing information taking into consideration the real world, peoples experiences and the feedback received. Through creativity, critical thinking and communication solutions are developed for prototyping with the assessment of scalability, bringing to the forefront innovation. The question is then how can this process be considered as a viable pedagogical approach for schools?

Currently, in schools, there is the demand to equip students with 21st century skill sets that often move beyond cognitive knowledge. Education needs to then develop a transition between transferring knowledge to developing individual potential. Education leaders and teachers are often facing a feeling of chaos or uncertainty when they are asked to execute holistic or interdisciplinary learning. The lack of a sufficient framework to execute in depth planning for interdisciplinary and holistic education programs is often the case.

The Verdon Centers’ prototype for the introduction of design thinking into teaching and learning programs, confirms that teachers and students alike developed a change in attitude to holistic, interdisciplinary programs with an increase in engagement and 21st century skill sets.

Introduction:

Krippendorff (2006) offers an approach dealing with design thinking as the creation of meaning rather than artifact. This can be expanded into having meaning as the core of the design process and the artifact is the medium for communicating the meaning. Inside of education, educators seek from their students an understanding of meaning and concepts. Traditionally, students would sit through content delivery to regurgitate their understanding of the content in a set assessment task. Educators would also interpret the curriculum, create a teaching and learning program that hit the content enabling them to “tick off” the progressions set out by outside agencies.

Content learning is important but for students to effectively internalise knowledge, metacognitive competencies or what is known as 21st century skill sets are necessary, in fact...
crucial. Students need to have access to an environment that enables them to learn, explore and apply metacognitive competencies in a controlled and safe manner. This then puts further pressure onto the teacher when they are planning and developing teaching and learning plans. To overcome the confusion and teachers resetting to a default teaching planning and delivery it is important for them to have a well explained, collaborated structure that addresses the needs of the modern classroom to optimise learning. The question then exists what would the planning format look like that would enable rich learning to occur optimising the opportunity of metacognitive competencies to be utilised? How do we address cross disciplinary approaches? How do we account for complexity rather than focusing on isolated parts of knowledge? How do we maintain momentum in adaption and adoption?

**Characteristics of Design Thinking:**

Learning is a process of understanding and to take it one step further it leads to modifications in the behaviours of the learner (Hasselholm and Gold, 2009). This can be achieved through experience, student involvement with a balance of instruction and construction. It enables the student to connect abstract knowledge and general principals in a meaningful way. Constructivist approaches are evident throughout many primary school classrooms. Dewey’s (1916) perspective to learning is closely connected to constructivist approaches with involving the student throughout the learning process. This enables a balance in instruction and construction and allows for real world experiences to take place. Education, in its current format takes complex real-world experiences and breaks it down into smaller isolated subjects and by using Dewey’s approach to constructivist pedagogy it enables classrooms to move away from isolated subjects immersing students into a more complex, abstract learning experience which can be still implementable for teachers.

Design thinking is a meta disciplinary methodology (Sheer, Noweski and Meinel, 2012). It can be said that it works in the same manner as what Dewey proposed but with a greater focus on metacognitive processes. It is a constructivist learning design with a focus on certain skills such as motivation for exploration, openness for new ideas, creative thinking. In other words, it predisposes itself to the generation of 21st century skills. The design thinking process (Fig 1) has the following steps that have a divergent, convergent and emergent components.
The process is as follows:

**Understand and Observe (Resurgent, divergent and emergent)**
An expanding process that will develop empathy and understanding. It provides the opportunity for a challenge to be set or a provocation. The goal is to then develop an understanding between the challenge and its context and to find out hidden concepts.

**Synthesis (Convergent and divergent)**
A consolidation process that defines the challenge deeply and its context. In the previous process there are many different perspectives and quite a lot of information can be developed. This phase allows this information to be condensed to meaningful insights in order to be able to generate actionable solutions. Critical thinking and interpretation skills are highly used here.

**Ideate (Emergent)**
An expanding process where collaboration occurs transforming the knowledge about the challenge and its context into actionable solutions. This is known in pedagogical approaches and the competence of applying knowledge.

**Prototype (Convergent, divergent and emergent)**
A consolidating phase that is about experimenting to bring ideas alive. Making the solutions tangible, actionable and testable. The goal here is to share ideas with others and to detail the abstract imaginings to obtain a mental concept in a real-world situation.
Test (Convergent)
An expansion process where the ideas are brought together to form the final solution in order to obtain feedback. This feedback is then utilised to make adjustments. The testing process is where a lot of information is gathered that is focused on the solution. It shows how well things have been understood.

When the Fig 1 is overlaid with Fig 2 the implementation of design thinking as a pedagogical consideration can be seen.

Figure 2: Design Thinking Enquiry Space, NoTosh.

Kretzschmar (2003), (Fig 3) introduced into the mix the Danish design ladder. The ladder then guides us to what level of design competence should be adopted in a workplace or even as an assessment tool to consider processes already in place. Using Kretzschmar ladder the education process can be investigated into what is being taught and how it is taught. This then gives educational institutions a starting point to deeply understand what the challenges are in their educational delivery, their professional learning and operational components. The ladder closely assimilates with Biggs (1996) Solo Taxonomy and can slowly progress students and understanding of the concepts. By using all three images it enables staff to also see the steps needed to progress in implementation of design thinking as an incorporated and inclusive pedagogy.
As theoretically described design thinking is a formalisation for constructivist learning focusing on metacognitive skills delivered in holistic, team-based learning method. With the case study at Westbourne Grammar School, the development of design thinking as a pedagogical shift was unpacked using a design thinking structure. The participants were always mindful of the work from Dufour and Fullan (2013) around PLC’s and when designing prototypes that it needed to be engaging for both students and teachers, easy to use, technologically ubiquitous, and steeped in real life problems. From the inception of the project participants were immersed in the design thinking process, which created a purposeful, deep understanding of the process which they could demonstrate to their colleagues. Fullan’s right drivers (2013) of capacity building, social capital, instruction and systemness were high on the project leader’s agenda for success and by creating and cultivating a culture that was simultaneously loose and tight enabled the participants to have more freedom in seeking solutions. It was also important to ensure that we all didn’t fall in to initiative fatigue or push our PLC teams in that direction as well.
THE CASE STUDY:
The 3-6 Leadership at Westbourne Grammar engaged a teaching representative from each year group Professional Learning Community (PLC) to participate in an incubator project over 12 months focused on design thinking. The four teachers were mentored by the STEM Curriculum Coach who was supported by the team from NoTosh. The educators were to subversively create gentle change in their PLC’s to engage other staff members in the design thinking process integrating STEM education, thus avoiding or minimizing initiative fatigue.

The team attended off site professional learning where they participated in hands on activities to unpack the design thinking process. This was an essential component of learning the skills needed to provide support for their PLC’s at school. The project needed to have a clear parameter that all prototypes were developed around. The project group established the need for the right balance providing a clear sense of direction by creating high expectations with a focus on student learning and convincing instruction with definitive achievement standards and common pedagogical practices. By working together at Independent Schools Victoria with NoTosh, the team had the opportunity to develop a trusting environment that enabled the participants to have credibility, social respect, personal regard for others, role competence and personal integrity through walking the talk. The professional learning and activities provided by NoTosh along with the independent, confidential, coaching sessions gave the group courage and a sense of achievement to be able to successfully support and create change.

The set goals of the project were as follows:

For students:

- Develop students’ digital ability in an authentic, purposeful manner
- Develop Fullan’s 6 C’s through the implementation of design thinking and STEM
- Develop metacognitive skills
- Develop and sustain global perspectives as an action learner through design thinking processes and STEM
- To work collaboratively across year groups with a wide variety of abilities
- For students to problem solve in a supported risk-taking environment where “failing forward” is part of the learning culture.
- Engaged students and teachers in all aspects of learning
- Passionate, creative, community-oriented learners

For Teachers:
● Developing a working knowledge of the design thinking process
● Creativity in developing learning programs following the inquiry process through design thinking
● To have confidence in exploring new ideas, areas and content
● Leading learning of their peers
● Work collaboratively not just in their PLC’s but across all year levels
● To have the confidence to enable students to guide their own learning journeys
● Re-invigorate staff in learning, increasing engagement and passion
● UbD’s – planning documentation reflects new learnings
● Regular scheduled meetings with the Design Thinking Leaders

Through the process of design thinking the group collaboratively came up with the following statement:

“How might we create better connections between classroom and specialist programs to provide a more integrated approach to student learning?”

The team explored the design thinking process (Fig 2.) to unpack already established units of inquiry at their year levels. By making design thinking a deliberate process in the classroom with teacher’s role modelling the concepts to students, education becomes a wicked problem that needs to be solved and not the regurgitation of content. During the PLC meetings there was time set aside to unpack the units of inquiry and reimagine them using the process in Fig 2. The teachers were supported by the participants with their experience and provision of ideas, resources for classrooms and activities that would make thinking more visible in the classroom. As the PLC’s unpacked their units of inquiry redeveloping the process of delivery, connections to specialists and STEM were becoming more evident and obvious in supporting a trans and meta disciplinary approach (Sheer, Noweski and Meinel, 2012). By having the support of their colleagues in their PLC, teachers were becoming more open to the idea of introducing more opportunities for students to practice metacognitive skill sets along with providing opportunities for STEM to occur. Specialists changed their teaching and learning programs to integrate and align closely with the classroom and students began to see a relationship between the learning areas.
Data and feedback were an integral part of the process. The feedback that teachers received from students was structured using visible thinking routines and enabled the teachers to see how the changes were being received by the students. The capacity for students to direct some of their own learning across subjects saw an increase in collaboration, communication, creativity, critical thinking and development of values for a course of action. This was demonstrated to a wider audience, outside of the classroom, in exhibitions of learning, that had a strong integration of the STEM subjects. The exhibitions of learning had a focus on the design thinking processes in the classroom and students articulated the process along with the metacognition that they participated in. In alliance with the exhibition of learning, students displayed their work with specialist subjects. This wholistic celebration of learning has been a success for the school community. Post exhibition of learning teachers of the PLC’s in year 3 -6 participated in whole department development of units of inquiry through using the design thinking enquiry space model. From this teacher were asked to provide feedback. This is an ongoing process.

The results stated that teachers felt 100% more confident in unpacking the curriculum and building programs of inquiry after participating in the process.76.7% of the staff found the Design Thinking Enquiry Space of benefit in the planning of units of inquiry. They also stated that they believed that the process enabled students to pursue deeper learning in a differentiated manner. They were able to see the strong links to the SOLO Framework and how they supported each other. The results state that they believed that the students were highly engaged and motivated but needed to be supported as they were not as resilient or independent as first thought. Interestingly the majority of student responses felt that they would like to create their own research questions and enjoyed the development of prototype the best. They felt that they had more opportunity to be creative, collaborative and communicate with others.

The successes of this prototype can be based around the work from Dufour and Fullan (2013), who put forward that the deepest professional learning occurs when it is:
- Job embedded and occurs in the workplace
- Engages people in work rather than listening to presenters
- Is collective and collaborative
- Is aligned with the systems goals rather than random interests
- Is evaluated on the basis of results.
The impact that design thinking has had in teaching and learning at the Verdon Centre is promising. It can be contributed to occurring in the workplace, engaged the staff as the experts, collective and collaborative, purposefully aligned to the school’s curriculum and teaching and learning programs along with constantly receiving feedback. The case study has resulted in higher levels of engagement and increased deeper learning along with a better understanding of metacognitive processes across a transdisciplinary approach. It has given teachers direction and guidance in the process of developing their units of inquiry. It can be concluded, that given more professional learning on site and time to do so, teachers would be more likely to repeat the process. It has been critical to give teachers a guiding framework (Fig 2) which has built confidence and the willingness to try something new with support thus lessening initiative fatigue. The frameworks have allowed STEM to effortlessly glide into the units of inquiry and be experienced in classrooms as students explore their immersion phases.
References


