

INNOVATIVE TEACHING PRACTICE

Paul McGuinness, Principal, Champion College, Gisborne

Sabbatical Period: Term 2, 2016

Updated Term 2, 2018

ACKNOWLEDGEMENTS

The Board of Trustees, Senior Leadership Team, staff, students and parents of Champion College for their input in the development and implementation of the innovative learning environment concept and to Deirdre McGuinness for her ongoing motivation and support.

EXECUTIVE SUMMARY

For the purposes of this report **innovative teaching practice** means teaching practices that research and current practice insights identify as having the greatest effect in engaging students in deep learning experiences that promote the skills and values desired for 21st century learning(OECD, 2013; Core Ed, 2017; Hattie, 2018).

We know that teachers account for about 30% of the variance in student achievement and while many teaching practices can have a positive effect on some students in the class, there are specific practices that are known to be more significant and meaningful than others (Hattie, 2012). It is these teaching practices that are the focus of this report.

The nine teaching practices promoted in this report are:

TEACHING PRACTICES TO PROMOTE AN INNOVATIVE LEARNING ENVIRONMENT: We aim for our teachers to be able to:		
	THEME	TEACHING PRACTICE
1	Teacher qualities to be promoted	Demonstrate leadership that is supportive of the ethos, culture and values of the school.
2		Demonstrate a collaborative approach to all teaching and learning
3		Always be passionate about making a positive impact on the learning of all students
4		Show sensitivity to the emotions and motivations of all learners
5	Student qualities to be promoted	Encourage agency in all learners
6		Encourage meta-cognitive skills in all learners
7	A focus on scaffolding & evaluating student progress	Build learning on the prior knowledge of each learner
8		Set challenging yet achievable tasks for all learners
9		Provide constructive feedback and feed forward for all learners

Each of these teaching practice areas is interrelated. Of the nine teaching practices identified there are three that this report suggests as the initial focus to promote in Campion College:

1. Demonstrate a collaborative approach to all teaching and learning
2. Encourage agency in all learners
3. Provide constructive feedback and feed forward for all learners.

Because of the overlapping nature of these practices a focus on the above three areas will inherently involve the other six practices.

PURPOSE

The purpose of this report is to review the literature on innovative teaching practice and develop a model to be used in a secondary school setting, namely Campion College

BACKGROUND

In this report an 'innovative learning environment' is taken to mean having a school-wide focus on innovative ways of organising learning for young people based on research and current practice insights" (OECD, 2013). The OECD promotes the following seven principles when designing an innovative learning environment:

1. "Make learning and engagement central.
2. Ensure that learning is social and often collaborative.
3. Be highly attuned to learner motivations and emotions.
4. Be acutely sensitive to individual differences.
5. Be demanding for each learner but without excessive overload.
6. Use assessments consistent with learning aims, with strong emphasis on formative feedback.
7. Promote horizontal connectedness across activities and subjects, in and out of school" (OECD, 2013, p.12).

The OECD also emphasises four core areas to focus on in the design of an innovative learning environment. These are:

- learners
- learning content
- educators
- resources (OECD, 2013).

While this report emphasises the role of innovative teaching practice within the core area on educators, it overlaps with and is dependent on all other areas involving learners, learning content and resourcing, for its full implementation.

Most countries throughout the world recognise the need to develop students' capability for 21st century learning. Much of the literature focuses on the shift to a knowledge society that advocates teaching *with* knowledge, as opposed to teaching

knowledge as an end in itself (Bolstad et al, 2012; OECD, 2010; Core Ed., 2017). This shift can be difficult in secondary schools where there is a strong emphasis on NCEA assessment and where there can be entrenched systems that make the adoption of 21st century skills difficult. For example, one significant constraint in secondary schools can be “timetabling (which) is seen as a significant obstacle to schools having a flexible approach to learning” (E.R.O., 2011, p. 3).

Many educationalists now believe that the key goals in learning are for students to develop adaptive expertise. This involves the ability to apply meaningfully-learned knowledge and skills flexibly and creatively in different situations (Hatano & Inagaki, 1986; Bransford et al., 2006). In adaptive expertise:

- Learners actively construct their knowledge and skills.
- Learners actively use strategies to set high learning targets which they self-monitor and are persistent in achieving.
- Learning is best understood in context rather than abstracted from the environment.
- Learning is not a purely solo activity but essentially a social one, involving the individual student, others in the learning environment and the resources (OECD, 2010).

Adaptive expertise links closely with the OECD principles for developing an innovative learning environment.

To help facilitate adaptive expertise in learners, Robinson, 2011, identified four aspects that schools should have an emphasis on:

1. Provide a safe and orderly environment for the learning to take place. (NB: Good classroom management has an effect size of 0.52 (Hattie, 2018)).
2. Encourage behavioural engagement in learning (i.e. students attend school and behave at school and take part in extracurricular activities.)
3. Encourage emotional engagement in learning (i.e. students enjoy some of their teachers or subjects or being involved in some activities outside the classroom.)
4. Encourage cognitive engagement in learning (i.e. students thinking about the concepts and skills they are learning, planning how to complete tasks & checking their own work. This includes self-regulatory strategies) (Wang & Holcombe, 2010 as cited in Robinson, 2011, p.127).

It is worth noting that “many of the 21st century ideas about what meaningful learning looks like, and how to support it, are actually not new. They have been around for a very long time and are well supported and practised by many teachers” (Bolstad et al, 2012, p.5). The challenge is how to achieve a shift across the whole school (and by extrapolation, the whole community) so that effective teaching practices that enhance these 21st century skills are known by all teachers and there is a consistent and uniform application of these practices by all teachers in the school (Bolstad et al, 2012).

FINDINGS

There are nine significant teaching practices that this report promotes in developing a school as an innovative learning environment.

1. LEADERSHIP SUPPORTIVE OF THE SCHOOL CULTURE

Every school has its own ethos, culture and values. This is known by the core set of principles that the school runs by and the way things are done in the school and the standards that are lived by (Rockeach, 1973; Russell, 2001).

When a school looks to align its practices with those that reinforce the principles behind innovative learning there will need to be a change in the current culture of the school. For example a move to self-directed learning, cross curricular, context based courses and collaborative teaching all requires significant changes in the way both students and teachers view their respective roles in the school. During this change process it is important to develop a shared understanding of the new values and beliefs to be promoted because this helps institutionalise the vision and culture of the school (Stolp, 1994).

While there are many definitions about what is meant by leadership, this report adopts the view that leadership involves bringing about change that is beneficial for the community (Bray, 1999, Telford, 1996, Duignan & Bhindi, 1998). All teachers are therefore involved in leadership in the school because they all have the intention of bringing about change with their students and with other staff.

We know that teaching practice is values rich. "We teach more by what we do than say" (Rogus & Wildenhaus, 1993, p.44) and "whoever our students may be, whatever subjects we teach, ultimately we teach who we are" (Shimobukuro, 1999, p.48).

The first and foremost teaching practice to be promoted for all teachers is an alignment between what the school ethos, culture, values and strategic vision advocates as it evolves into an innovative learning environment and what the teacher says and does in the classroom and in the wider community. When there is a variance between these two components there is an increased chance of students and the community losing confidence in either the school as a whole or in the individual teachers, depending on the perceptions of the student and the community. Teacher credibility has an effect size of 0.90 (Hattie, 2018, p.138). (NB: An effect size of 0.4 is the average impact on students of one year's teaching).

The disconnect between the school and the teacher will either undermine the changes being introduced by the school or it will undermine the student's confidence in the quality of the teacher or it will undermine the credibility of the teacher's colleagues. In any of these situations it increases the possibility of disengagement of students in their learning.

2. COLLABORATIVE TEACHING AND LEARNING

Teaching can become a very isolated profession. Ruddick (as cited in Fullan & Hargreaves, 1991) acknowledged that “education is among one of the last vocations where it is legitimate to work by yourself in a space that is secure against invaders” (p.38). “When an environment exists where there is a lack of positive feedback it is possible for teachers to become professionally estranged within their workplace isolation and begin to neglect one another. This may lead to individualism as professionals and the possibility of safe, non-risk taking teaching which does little to enhance student achievement” (Fullan & Hargreaves, 1991, p.39).

Collaborative teaching is an approach to teaching that aims for all teachers in the school to have the same positive impact on student learning as the best teachers have on their most effective days (OECD, 2013; Core Ed., 2017; Hattie, 2018).

In this report collaborative teaching means ‘a group of teachers working together and cultivating the expertise of everyone in the group in the belief that they can positively influence the learning outcomes for all students so they can gain more than a year’s growth for a year’s input, including those who are disengaged and/or disadvantaged’ (OECD, 2013; Core Ed. 2017; Hattie, 2018). Under this definition fully collaborative teaching requires: “analyzing the learners’ initial learning levels together, setting and formulating instructional goals together, designing tasks together...delivering the lesson together, and finally, evaluating the lesson together... It also requires...the mind frame to make a mistake before one’s colleague, to make compromises, to restrain oneself and hold back one’s own ideas and preferences, to be ready to assume responsibility for tasks that one is perhaps not particularly good at, or to have the courage to try something out that involves relying on a colleague” (Hattie, 2018, p.34).

Demonstrating a collaborative approach to teaching and learning provides the greatest influence that teachers can have on student achievement. When extended across the whole school it can led to an improvement in learning outcomes of nearly four times greater than is the average impact on students of one year’s teaching. (NB: Hattie (2018) does not refer to collaborative teaching but talks of collective efficacy. The definition he uses and the definition of collaborative teaching used in this report cover the same concepts. Hattie’s work shows that collective efficacy has an effect size of 1.57).

The effectiveness of collaborative teaching becomes more apparent if it is accepted that the variability in teaching practice between schools in New Zealand is far smaller than the variability within schools (Hattie, 2012). This means that there are some teachers in every school who are not as effective at bringing about positive gains in learning for students as the best teachers in that school. The variability goes even further than this as Hattie states that even the best teachers in a school can have days when their teaching is highly effective and days when it is not (Hattie, 2012; Hattie, 2018).

When collaboration is working well teachers have access to ongoing direct learning opportunities from each other and practical opportunities for some of the teachers to work with smaller groups of students around specific problems while other teachers maintain the class direction. Teaching in front of our peers also indirectly elevates accountability amongst the teachers (Core Ed, 2017). Collaborative teaching also enhances problem solving amongst teachers as their experiences, knowledge and talents are combined (Hattie, 2018).

One of the types of teaching that is sometimes referred to as collaborative teaching is when one teacher does the teaching and the other teacher observes and then they reverse roles. This is not collaborative teaching as defined in this report, as the teachers “do not teach with one another but after one another” (Hattie, 2018, p.34). This has also been referred to as the ‘radiator effect’ as one teacher ‘rests on the radiator’ while the other teacher takes the class and then the teachers reverse their roles (Hattie, 2018). This style of teaching has an effect size of only 0.19 (Hattie, 2018).

It is also important to note that true collaboration “is not about delegating responsibility, taking turns to do essential tasks, assigning roles to teachers with specialist capabilities or sharing parts of a task to get things done. These factors may be part of a practice that emerges in a collaborative environment, but are not in themselves synonyms for collaboration” (Core Ed, 2017).

In the most effective collaborative groups, teachers:

1. follow a recognised process that is understood and agreed to by all members of the group
2. know the intended outcomes of the collaboration and these are agreed to and understood by all in the group
3. jointly co-plan the lessons
4. show a willingness to try new teaching approaches,
5. set challenging goals for their students,
6. attend closely to the needs of students who require extra assistance,
7. foster positive behaviour in students,
8. raise students’ expectations of themselves by convincing them that they *can* do well in school
9. explore how technology can be used to enhance collaboration
10. recognise how diversity within the group can lead to improved outcomes
11. recognise the strengths and the weaknesses within each person’s teaching practices and the ability to learn from others in the group (ako)
12. have the ability to challenge each other’s teaching practices with a focus on improvement
13. have confidence in their abilities as a teacher and have a high level of trust in their colleagues (to enable the robust discussions that result from collaboration)
14. constantly analyse what is effective in their teaching and why it is effective and what is not effective in their teaching and why it is not effective and what can be changed (Core Ed, 2017; Hattie, 2018).

3. PASSIONATE ABOUT MAKING A POSITIVE IMPACT ON EACH STUDENT

Teacher belief systems and the teacher's attitude to the ability of each of their students to learn are at the core of student achievement. If teachers believe that they can positively influence a student's learning outcomes then this is more likely to happen. But also, if teachers believe that there is very little they can do to influence a student's learning outcomes due to other factors beyond their control then this is also very likely to happen"(Hattie, 2018).

Rubie-Davies (2014) showed that a teacher often has high, medium or low expectations for all the students in their class and the students who have been given high expectations by teachers will be successful in achieving the teacher's expectations and the students who have been given low expectations are successful in achieving at this level. While this could be attributed to teachers being acutely aware of the capability of their students prior to the learning activity, Rubie-Davies showed that often the students responded to the expectation conveyed by the teacher. Students tend to reach the expectations that teachers have of them.

We know that "teachers do not create learning; only learners can do this and so many have called for a shift in the role of the teacher from the "sage on the stage" to the "guide on the side" (William as cited in OECD, 2010, p.152). The danger with such a characterisation is that it is often interpreted as relieving the teacher of responsibility for ensuring that learning takes place...instead the teacher should be "responsible for 'engineering' a learning environment, both in its design and its operation" (William as cited in OECD, 2010, p.152).

One way of engineering this desired learning environment is for teachers to adopt the position that if a student is not engaged or progressing in their learning then it is because we, as teachers, are not using the right teaching strategies to motivate and engage them (Hattie, 2012). This reinforces the fact that "the teacher's view of his or her role is critical" (Hattie, 2012, p.14).

Hattie states that "what does matter is teachers having a mind frame in which they see it as their role to evaluate their effect on learning" (Hattie, 2012, p.15). He emphasises that "powerful, passionate, accomplished teachers...seek feedback about their effect on the progress and proficiency of all students (Hattie, 2012, p.19). The impact of this is that high impact teachers have almost a year's advantage over students who are in a low-impact teacher's class (Slater, Davies, & Burgess, 2009).

One of the teaching practices to be strongly promoted with all teachers is for them to be passionate about knowing on a regular basis, the size and the nature of their impact on the learning of every student in their care (Hattie, 2012).

4. SENSITIVITY TO MOTIVATIONS AND EMOTIONS OF ALL LEARNERS

The motivation and emotion that a student brings to the learning situation has a high impact on their ability to learn and their ability to persevere in their learning when they are not immediately successful (OECD, 2010; Hattie, 2018). Motivation has an effect size of 0.48 on learning (Hattie, 2018, p.49). Motivation refers to how students see themselves within the subject or topic that they are learning. For example if a student does not believe they can do mathematics then this motivation affects the effort and energy that goes into the learning (OECD, 2010).

If a student believes that they can achieve a task he or she will invest more effort in the task and persist longer and is more likely to continue beyond the obligatory requirements of the task (Schunk & Pajares, 2004).

If a student is not successful with some learning then their motivation to continue depends on the reason they attribute to it. If the student attributes any failure as being the result of a strategy that was used and not due to their ability in the subject then he or she is more likely to persevere with the learning (Zimmerman & Kitsantas, 1997). Teachers can help increase the likelihood of perseverance in learning by providing the desired outcomes to the student before the task is started and to provide one or more strategies that could be used to increase the chance of success in the learning. When the student completes the task he or she then reviews the adequacy of the strategies that were used (Hattie, 2018). This approach also links with the teaching practices that promote meta-cognition and the feedback and feed forward strategies.

Emotion refers to the feelings, moods and well-being of the student. Emotions increase the level of arousal and prepare the person to react swiftly in response to some feeling or perceived issue. It is the way that a student interprets this arousal that determines whether it is beneficial for learning or detrimental. For example, a student who interprets an increased level of arousal before an exam with negative emotions such as anxiety or worry has a greater chance of being impeded in their exam performance. A student who interprets the increased level of arousal before the exam as a challenge can increase their performance (Frijda, 1986). Some emotions such as anger, relief and joy, have very little impact on learning because they are short lived, but emotions such as hopelessness and shame have long term negative effects on learning because they are firmly entrenched in the learning situation (OECD, 2010).

When students are faced with a new learning task they often respond in the following sequence:

First: What does this task involve?

Second: What prior knowledge do I have about this task?

Third: How motivated am I and how do I feel about this task based on previous experiences.

Teachers must be sensitive to these individual differences and in the first instance see if they can adapt the learning activities accordingly (Boekaerts, 2006) and then

look to carefully scaffold the learning to help the student overcome their motivational or emotional response.

Students will not invest effort and energy into a task that they consider has minimal value. It is the student's perception of the relevance or importance or interest of the task that is the best predictor of their level of persistence and challenge for the task (Wigfield and Eccles, 2002).

Students are more motivated to engage in learning:

- When they feel competent to do what is expected of them.
- When they can attribute failure to specific strategies they used and not to personal ability.
- When they value the subject or task.
- When they experience positive emotions towards the activities.
- When they perceive the environment as favourable for learning.
- When they can control and reduce the intensity and duration of any negative emotions that they feel (OECD, 2010).

One way that teachers can increase motivation and emotional responses in students is to value and respect them as learners and as people, and demonstrate care and commitment towards them (Hattie, 2018). Teachers also need to be aware where each student's motivational levels sit in relation to the learning and set the new learning just above the student's current reach so they are encouraged to scaffold their learning to achieve goals that they see as being academically demanding but without undue emotional stress (OECD, 2010).

5. LEARNER AGENCY

Learner agency is a term used to describe students having full control over their learning. "They are the ones in the driver's seat – their unique abilities, talents and interests are not simply recognised by the teacher and then catered for- they are what drives the curriculum design and the pedagogical approaches that follow" (Core Ed., 2017).

Learner agency has been found "to correlate strongly with academic achievement and this has been found in different subject areas" (Zimmerman & Risemberg, 1997).

We often refer to classes where there is a focus on learner agency as being 'student-centred' but Bolstad et al (2012) say that "the challenge is to move past seeing learning in terms of being "student-centred" or "teacher-driven", and instead to think about how learners and teachers would work together in a "knowledge-building" learning environment. This is not about teachers ceding all the power and responsibility to students, or students and teachers being "equal" as learners. Rather, it is about structuring roles and relationships in ways that draw on the strengths and knowledge of each in order to best support learning" (p.42)

One of the major difficulties in developing learner agency is for the teacher to recognise that they need to apply different types of interactions with students, different pedagogies and different forms of support and scaffolding for learning.

Students also often need support in developing learner agency. There is a risk that some students may feel that they are not “sufficiently scaffolded in their learning, when they have been accustomed to more traditional approaches” (Bolstad, 2012, p.36).

In scaffolding learner agency “learners may benefit from both intrinsic and extrinsic factors” (Hattie, 2012 p.42), although care needs to be taken in this as “too much external motivation can lead to shallow learning of the surface features and completion of work for the sake of ...reward” (Hattie, 2012 p.42). There is a risk that if students are strongly motivated for extrinsic reasons they can become dependent on adult direction and “start to fail when they are expected to regulate their own learning” (Hattie, 2012, p.43). Hattie notes that the greater the shift to “intrinsic motivation, the greater the investment in learning, which then leads to greater learning gains” (Hattie, 2012, p.42).

When learner agency is embedded we know that:

1. students are able to self-regulate their learning through planning, organising and monitoring their work and evaluating what they have accomplished and what still needs to be done
2. students set challenging yet achievable goals which they monitor frequently. They set a high standard before they are satisfied with the level of their work
3. students are aware of the responsibility they have for their own actions and the impact of these actions on the learning of others
4. learner study time is managed well
5. students persist with their learning despite obstacles (Core Ed.,2017; Hattie, 2012)

6. META-COGNITIVE SKILLS

Meta cognition can be described as “having cognition about one’s own cognition” (Hartman, 2001) or put in another way, when you learn something new you have the ability to understand how this knowledge was constructed so that the process can be repeated in any new situations. The focus is more on the process of learning than on the actual content of the learning (Core Ed., 2017; Hattie, 2018). Metacognitive strategies have an effect size of 0.69 (Hattie, 2018, p.78).

Hattie argues that metacognitive skills need to be explicitly taught to students. (Hattie, 2012) To do this, teachers can focus their teaching on three levels of learning: surface features, deep features and concepts.

- **Surface features of learning:** Surface features focus on the rules specifying how to solve problems. They are like recipes in that they show the concrete steps that have to be executed in order to reach a goal. They include acceptance of facts and ideas uncritically, relying on rote learning, a focus on formulae needed to solve a problem, factual recall and knowing what is needed to gain a passing grade.
- **Deep features of learning:** Deep features focus on abstract or more general statements about how ideas relate to each other and extend to other learning.

This includes examining new facts and ideas critically, looking for meaning, active learning, focusing on the central argument or concepts needed to solve a problem, interacting actively and distinguishing between argument and evidence (Core Ed., 2017; Hattie, 2012).

- **Conceptual understanding:** Conceptual understanding combines the surface and deep features of learning to build new surface and deep understandings such as thinking of alternatives, thinking of criticisms, proposing a problem or a solution and criticizing the solution (Bereiter, 2002).

The aim is for the surface features to be well-practised so that students can solve routine problems efficiently and with minimum cognitive resources which then leaves cognitive energy available to solve the deeper and more complex problems (Siegler, 2003).

Hattie(2012) states that “the most powerful model for understanding these three levels and integrating them into learning intentions and success criteria is the SOLO (structure of observed learning outcomes) model developed by Biggs and Collins (1982)” (p.54).

S.O.L.O. TAXONOMY				
LEVEL	Stage	Description	Learning Level	
1	Uni-structural	“I can describe one idea about the learning”	Surface features of learning	Conceptual Understanding
2	Multi-structural	“I can describe two or more ideas about the learning”		
3	Relational	“I can relate my ideas together. I see the relationships that exist.”	Deep features of learning	
4	Extended abstract	“I can extend my understanding about the learning to new situations”		

The first two levels of the SOLO taxonomy develop the surface features of learning. The next two levels develop the deep features of learning. “Together, surface and deep understanding lead to the student developing conceptual understanding” (Hattie, 2012, p.54).

In developing their practices Hattie states that teachers should “spend more time working through their notions of what success looks like in terms of the balance of surface and deep before they teach the lesson; they must make these proportions clear to the students, use a great deal of formative evaluation to understand how the students are learning at both surface and deep levels, and ensure that the assessments and the questions asked by students (and teachers) in the class are appropriate to the desired balance of surface, deep and conceptual learning” (Hattie, 2012, p.77).

According to Hattie many experienced teachers are effective in developing surface features with students but only the more 'expert' teachers are able to focus for longer periods on the deep features. Expert teachers can focus on deep features 70% of the time in class whereas 'experienced' teachers focus on deep features only 30% of the time (Hattie, 2012). It is important to get the proportions of surface to deep learning correct which, when achieved, can have an effect size of 0.71 which means that it has an impact far greater than the average effect size of a year's teaching of 0.40. When giving assessments Hattie argues that at least 30 per cent of items in an assessment should be at the surface level and at least 30 per cent should be at the deep level to create optimal assessments (Hattie, 2012).

Teachers must know a range of learning strategies to build the students' surface knowledge, deep knowledge and understanding, and conceptual knowledge (Hattie, 2018). This ability to focus on both surface features and deep features in the right proportions so that every student is able to develop a conceptual understanding of the learning is sometimes referred to as having strong pedagogical content knowledge (Shulman, 1987). The critical aspect with this is that while teachers must not only possess good content knowledge about the subject and good pedagogical knowledge about how to teach, they must also know how to scaffold this knowledge within a particular subject area so that the balance of surface to deep learning features is at the correct level for each student to progress in their learning.

7. PRIOR KNOWLEDGE

It has been recognised for the past 50 years that having an understanding of the prior knowledge that each student has is a critical component in good teaching practice. As Ausubel (1968) described it "If I could reduce all of educational psychology to one principle, I would say this: the most important single factor influencing learning is what the learner already knows. Ascertain this and teach him accordingly" (p.iv).

Studies have shown that prior knowledge explains between 30% and 60% of the variance observed in students learning results (Dochy, 1996). Hattie concurs with this stating that "moving from what students know now to explicit success criteria has an effect size of 0.67...we must know what students already know, know how they think, and then aim to progress all students towards the success criteria of the lesson" (Hattie p 37, 39).

One of the major problems with focusing effectively on prior learning is that it is most probably the single most important individual difference in learners (Mayer as cited in OECD, 2010, Chapter 8). This means that the teaching needs to be structured to individual student strengths and understandings and not taught as a single package to the class. Glaser (1977) argued that schools should focus on adaptive education as the way of enabling individual differences in prior knowledge to be used as the baseline for all new learning for that student.

When people learn new material they first try to make sense of new information by linking it to their past experiences. Once the material is learned it then becomes part of the package of experiences that they draw on for further learning. If the new learning is carried out without the student linking it to their previous knowledge then it is possible for them to hold two different understandings of the same concept without being aware of the contradiction. Learners often fail to see the abstract relationship between pieces of knowledge acquired in superficially different situations (diSessa, 1988). The student will then activate one of the two concepts depending on the nature of a situation they are in; ie: the student could hold one understanding of how to draw a graph in one subject but hold a completely different (and incorrect) view of how to draw the same type of graph in a different subject. If they have not linked the relationship they will activate the different graph depending on what subject they are taking (Taber, 2001). The learning programme may look well-organised from a teacher's point of view but could be fragmented and disconnected from their students' point of view (Linn, 2006).

8. CHALLENGING YET ACHIEVABLE

“No matter where the student starts, he or she deserves at least a year's growth for a year's input” (Hattie, 2018, p.4). Many schools and teachers often talk about students 'doing their best'. Hattie argues we should be more discerning and focus on setting challenging rather than do your best goals as these are more clearly defined and can be objectively scaffolded to just above the reach of the student. In do your best goals it can be ambiguous if the result achieved was really the best that could have been achieved (Hattie, 2009).

A focus in developing innovative teaching practice is to devise programmes that demand hard work and challenge without excessive overload (OECD, 2010). If the academic challenge is set a little above the current level of the student it is possible for the student to scaffold their learning based on prior knowledge to reach the new goal. If the academic challenge is set too high then the student will not be able to bridge the gap in their knowledge. This can lead to anxiety, not investing effort and a sense of failure. If the academic challenge is set too low then this can lead to boredom and a disservice has been done to the student. This process is sometimes referred to as the 'Goldilocks principle'. The challenge is not too big, nor too small but just right (Hattie, 2018, p.16). It is also not good practice to just say to students to “give it a try” or tell a student that success will come if they just invest effort. Unwarranted encouragement can make a student overconfident when he or she may not have the skills required to match their self-belief. In these situations repeated failure can lead to decreased effort and abandonment of the task (Schunk & Pajares, 2009).

Striving for a challenging goal has an effect size of 0.75. The challenging goal can be achieved by having a clear understanding of where the student is currently at in the material to be learnt and then decide what one year's progress would look like for one year's input. In order to achieve this, the teacher will need to be very clear about what success would look like for each student before they start teaching. The

advantage of this is that these success criteria can then be conveyed to the student (Hattie, 2018).

Goal setting for students is one technique that the student can use to identify where they are currently at in their learning and where they could aim to be after one year's growth. The goal should be challenging yet achievable and it should stretch the student just beyond their upper level of attainment. It is important that goal setting is established by the student, with guidance from the teacher. When students have full agency over their learning they are able to set their own goals. Goals that are set for students by the teacher or by parents do not have the same level of student ownership. Often curriculum goals are too far removed to be effective in the day to day learning. This report proposes that curriculum goals should be established and then used by the classroom teachers as a basis to drill down as to how that would look on a day by day basis for the student. When students develop S.M.A.R.T. goals the feed forward or next steps provided in conjunction with the class teacher enable the goal to be broken down into smaller, achievable steps that scaffold the learning and extend the student just beyond their current level of understanding. These next steps get repeated on an ongoing basis to build toward the overall goal of what one year's progress would look like for one year's input (Hattie, 2018).

9. FEEDBACK AND FEED FORWARD

Feedback and feed forward are two formative assessment strategies used to help guide student learning. Feedback gives information to the student about how he or she is progressing in the learning. It can either help keep students motivated or it can highlight important aspects to focus on. Feed-forward identifies the next steps to be taken.

Feedback and feed forward are important because “even when teachers design high quality learning activities aimed at particular skills, and even when they take into account the student's prior knowledge, what is learned can often be quite different from the intended goal (Denvir and Brown (1986a; 1986b). Learning is not linear nor is it predictable. It is necessary to regularly review the gap between the teaching and the learning that is taking place for each student, both for the benefit of the student and for the benefit of the teacher. The student needs to alter their learning processes in light of what they understand and the teacher needs to alter their approach to teaching in light of what the student understands.

The quality of the feedback and feed forward that is given is critical (Bangert-Drowns *et al.*, 1991). Feedback has an “average effect size of 0.75” (Hattie, 2018, p.81) however the results are variable depending on the type of feedback given. In 38% of studies undertaken feedback has been actually found to lower performance (Kluger and DeNisi (1996)). There is very little benefit in just giving feedback to a student about their current achievement. To maximise the impact of feedback it needs to engage students in mindful activity (Bangert-Drowns *et al.*, 1991).

In providing feedback and feed forward students need to know:

- Where am I going? (What are the learning intentions and what are the success criteria?)
- How am I going? (How well do I understand the success criteria? (NB: This is provided by quality feedback.
- Where do I go next? (What are the next steps to take to learn the surface features, the deep features and the concepts?) This is provided by high quality feed forward (Hattie, 2009).

Feedback should focus on the specific features of the task, and provide suggestions on how to improve. Just indicating to students whether they were correct or not with the work they have submitted does not result in an improvement in learning. An added caution to this is not to go too far in the opposite direction so feedback is so detailed that students do not need to think for themselves (OECD, 2010).

Feedback is not just for the benefit of students. One of the major benefits of feedback is for teachers. "If teachers consider assessments as primarily feedback to them, then this can alter the nature of assessments, can provide more information about how to adjust the teaching, and help understand where best to move next-for the teacher and particularly then for the student" (Hattie, 2018, p.14).

The teacher needs to provide direction and redirection in terms of the content being understood, and thus make the most of the power of feedback. "The greater the challenge, the higher the probability that one seeks and needs feedback and the more important it is that there is a teacher to ensure that the learner is on the right path to successfully meet the challenge" (Hattie, 2012, p.18).

When the teacher receives feedback that shows that the student is not progressing in their learning at a challenging rate they must consider what other interventions will provide the necessary framework to change this. One proven and successful strategy for teachers to adopt when looking at the range of interventions available to help learners is the Universal Design for Learning (U.D.L.) framework. U.D.L. is based on neuroscience research and focuses teachers on providing multiple ways of increasing engagement in learning, increasing the opportunities for students to learn and increasing the options for how students can demonstrate their learning. One of the benefits of U.D.L. is that when an alternative teaching strategy is adopted by the teacher in response to a particular student, then this strategy often has significant benefits for others in the class also (Core Ed., 2017). UDL can link strongly to and form the basis of any teacher enquiry into the effectiveness of their teaching.

IMPLICATIONS

Campion College is a Year 7 to 13, Catholic integrated co-educational College situated in Gisborne, New Zealand with a maximum roll of 512 students. The College has recently undergone a rebuild of 60% of its teaching spaces under the innovative learning environment (I.L.E.) framework. The standard classrooms have been replaced with larger learning centres with break out spaces attached. The spaces

can accommodate 85 students and 3 to 4 teachers. The College has also restructured the curriculum to provide cross-curricular, context based learning and the opportunity for students to lead their own learning through 'impact projects'. The College is fully digital with all students having their own laptop or similar.

The College now wants to focus on the most effective teaching practices to maximise the impact of this newly developed learning environment. While all the above nine areas are interrelated it was decided that, given where the College is positioned in its development as an innovative learning environment, professional learning and development would focus on three of the nine areas of teaching practice; one from each of the three themes. These three areas were:

- Demonstrate a collaborative approach to all teaching and learning
- Encourage agency in all learners
- Provide constructive feedback and feed forward for all learners

These three areas were considered likely to create the greatest shift in teaching practice within the College given that the newly developed learning centres and curriculum are in place. These three areas also overlap with the other six areas of practice. For example it would be difficult to not include SOLO taxonomy within work on feedback and feed forward and it would not be possible to develop learner agency without including the areas of prior knowledge and setting challenging tasks.

BENEFITS

The full benefits of the strategic direction undertaken within the College will be felt over the coming years

- As students learn to work with others to actively construct their knowledge and skills and use strategies to set high learning targets which they self-monitor and are persistent in achieving, and
- As teachers learn to work in a fully collaborative way to consistently re-evaluate their effectiveness in engaging students in learning and collectively developing strategies to fully engage students in learning the skills required for 21st Century learning.

CONCLUSION

The purpose of this report was to review the literature on innovative teaching practice and develop a model to be used in a secondary school setting, namely Champion College. The literature review had a strong focus on the work undertaken through the OECD and also the meta- analyses carried out by Hattie.

There are many ways that the findings could be grouped in order to provide a focus for adoption within a school setting. The teaching practice areas that were identified are those that align with innovative learning environments along with where Champion College is at with their progression into this environment.

REFERENCE LIST

Ausubel, D.P. (1968), *Educational Psychology: A Cognitive View*, Holt, Rinehart and Winston, New York.

Bangert-Drowns, R., C. Kulik, J. Kulik and M. Morgan (1991), "The instructional Effect of Feedback in Test-Like Events", *Review of Educational Research*, Vol. 61, No. 2, pp. 213-238.

Bereiter, C. (2002). *Education and mind in the Knowledge age*. Hillsdale, NJ: Lawrence Erlbaum Associates.

Boekaerts, M. (2006), "Self-Regulation and Effort Investment", in E. Sigel and K.A. Renninger (eds.), *Handbook of Child Psychology*, Vol. 4, Child Psychology in Practice, John Wiley and sons, Hoboken, NJ, pp. 345-377.

Bolstad, R., Gilbert, J., McDowall, S., Bull, A., Boyd, S., Hipkins, R. (2012). *Supporting Future-Oriented Learning and Teaching*. New Zealand Council for Educational Research. Retrieved from www.educationcounts.govt.nz/publications.

Bransford, J., N. Vye, R. Stevens, P. Kuhl, D. Schwartz, P. Bell, A. Meltzoff, B. Barron, R. Pea, B. Reeves, J. Roschelle and N. Sabelli (2006), "Learning Theories and education: Toward a Decade of synergy", in P.A. Alexander and P.H. Winne (eds.), *Handbook of Educational Psychology Second edition*, Mahwah, NJ: Lawrence Erlbaum Associates, pp. 209-244.

Bray, P. (1999). Leadership for the next century. *The practising Administrator* 21(4) 12-14

Core Ed. (2017). *Campion College internal professional learning programme*. Available: P.O.Box 1151, Gisborne, New Zealand.

diSessa, A.A. (1988), "Knowledge in Pieces", in G. Forman and P.B. Pufall (eds.), *Constructivism in the Computer Age*, Erlbaum, Hillsdale, NJ, pp. 49-70.

Denvir, B. and Brown, M. L. (1986a), "Understanding of Number Concepts in Low-attaining 7-9 year olds: Part 1. Development of Descriptive Framework and Diagnostic Instrument", *Educational Studies in Mathematics*, Vol. 17, No. 1, pp. 15-36.

Denvir, B. and Brown, M. L. (1986b), "Understanding of Number Concepts in Low-Attaining 7-9 year olds: part II, The Teaching Studies", *Educational Studies in Mathematics*, Vol. 17, No. 2, pp. 143-164.

Dochy, F.J.R.C. (1996), "Prior Knowledge and Learning", in E. De Corte and F.E. Weinert (eds.), *International Encyclopaedia of Developmental and Instructional Psychology*, Oxford, UK: Elsevier Science, pp. 459-464.

Duignan, P. & Bhindi, N. (1998). An authentic leadership framework for Catholic systems and schools. In P. Duignan & T. d'Arbon (eds), *Leadership in Catholic education: 2000 and beyond*, Chapt 8.

E.R.O. (2011). *Enterprise in the New Zealand Curriculum*. Wellington: Education Review Office. Retrieved from www.ero.govt.nz

Fullan, M. & Hargreaves, A. (1991), *What's worth fighting for? Working together for your school*. Hawthorn: A.C.E.A. Australian Council for Educational Administration. P. 37-62.

Frijda, N.H. (1986), *The Emotions*, Cambridge University Press, Cambridge, UK.

Glaser, R. (1977), *Adaptive Education: Individual Diversity and Learning*, New York: Holt, Rinehart and Winston.

Hartman, H. J. (2001), *Metacognition in Learning and Instruction*, Kluwer, Dordrecht.

Hatano, g. (1996), "a conception of knowledge acquisition and its implications for Mathematics education", in L.P. Steffe et al. (eds.), *Theories of Mathematical Learning*, Mahwah, NJ: Lawrence Erlbaum Associates, pp. 197-217.

Hattie, J. (2009). *Visible Learning*. London: Routledge.

Hattie, J. (2012). *Visible Learning for Teachers*. London: Routledge.

Hattie, J. (2018). *10 Mindframes for Visible Learning*. London: Routledge.

Kluger, A.N. and DeNisi, A. (1996), "The Effects of Feedback Interventions on Performance: a Historical Review, a Meta-Analysis, and a Preliminary Feedback Intervention Theory", *Psychological Bulletin*, Vol. 119, No. 2, pp. 254-284.

Linn, M. C. (2006), "The Knowledge Integration Perspective on Learning and Instruction", in R. K. Sawyer (ed.), *The Cambridge Handbook of the Learning Sciences*, Cambridge University Press, New York, pp. 243-264.

OECD (2013), *Innovative Learning Environments*, Educational Research and Innovation, OECD Publishing.

<http://dx.doi.org/10.1787/9789264203488-en>

OECD (2010), *The Nature of Learning, Using Research to Inspire Practice*, OECD Publishing

www.oecd.org/publishing

Robinson, V., (2011). *Student-Centered Leadership*. San Francisco: Jossey-Bass

Rockeach, M. (1973). *The Nature of Human Values*, The Free Press, New York, NY.

Rogus, F. & Wildenhaus, C. (1993). Preparing leaders for Catholic schools: A focus on the principalship. *Current Issues in Catholic Higher Education*, 14 (1).

Rubie-Davies, C. (2014). *Becoming a high expectation teacher: Raising the bar*. London: Routledge.

Russell, R. (2001). The role of values in servant leadership. *Leadership and Organization Development Journal*, 22 (2), 76-83.

Shimabukuro, G. (1999). The Catholic identity of the teacher: An invitation to wholeness in a challenging new age. *Momentum*, 30 (2).

Schunk, D.H. and Pajares, F. (2004), "Self-Efficacy in Education Revisited: Empirical and Applied Evidence", in D.M. McInerney and S. Van Etten (eds.), *Big Theories Revisited*, information age publishing, Greenwich, CT, pp. 115-138.

Schunk, D.H. and Pajares, F. (2009), "Self-Efficacy Theory", in K. Wentzel and A. Wigfield (eds.), *Handbook of Motivation at School*, Routledge, New York and London

Siegler, R.S. (2003), "Implications of Cognitive Science Research for Mathematics Education", in J. Kilpatrick, W.B. Martin and D.E. Schifter (eds.), *A Research Companion to Principles and Standards for School Mathematics*, National Council of Teachers of Mathematics, Reston, VA, pp. 219-233.

Slater, H., Davies, N., & Burgess, S. (2009). *Do teachers matter? Measuring the variation in teacher effectiveness in England*. Centre for Market and Public Organisation Working Series No. 09/212

available online at www.bristol.ac.uk/cmppo/publications/papers/2009/wp212.pdf

Shulman, L. (1987), "Knowledge and Teaching: Foundations of a New Reform", *Harvard Educational Review*, Vol. 57, No. 1, p. 1-22.

Stolp, S. (1994). *Transforming schools through collaborative leadership*. London: Falmer Press

Taber, K.S. (2001), "Shifting sands: a case study of conceptual Development as competition between alternative conceptions", *International Journal of Science Education*, Vol. 23, No. 7, pp. 731-753.

Telford, H. (1996). *Transforming schools through collaborative leadership*. London: Falmer Press.

Wigfield, A. & Eccles, J. S. (2002), "The Development of Competence Beliefs, Expectancies for Success, and Achievement Values from Childhood through Adolescence", in A. Wigfield and J.S. Eccles (eds.), *Development of Achievement Motivation*, Academic Press, San Diego, CA, pp. 91-120.

Zimmerman, B. & Kitsantas, A. (1997), "Developmental Phases in Self-Regulation: Shifting from Process to Outcome Goals", *Journal of Educational Psychology*, Vol. 89, No. 1, pp. 29-36.

Zimmerman, B.J. & Risemberg, R. (1997), "Self-Regulatory Dimensions of Academic Learning and Motivation", in G.D. Phye (ed.), *Handbook of Academic Learning: Construction of Knowledge*, San Diego, CA: Academic Press, pp. 105-125.