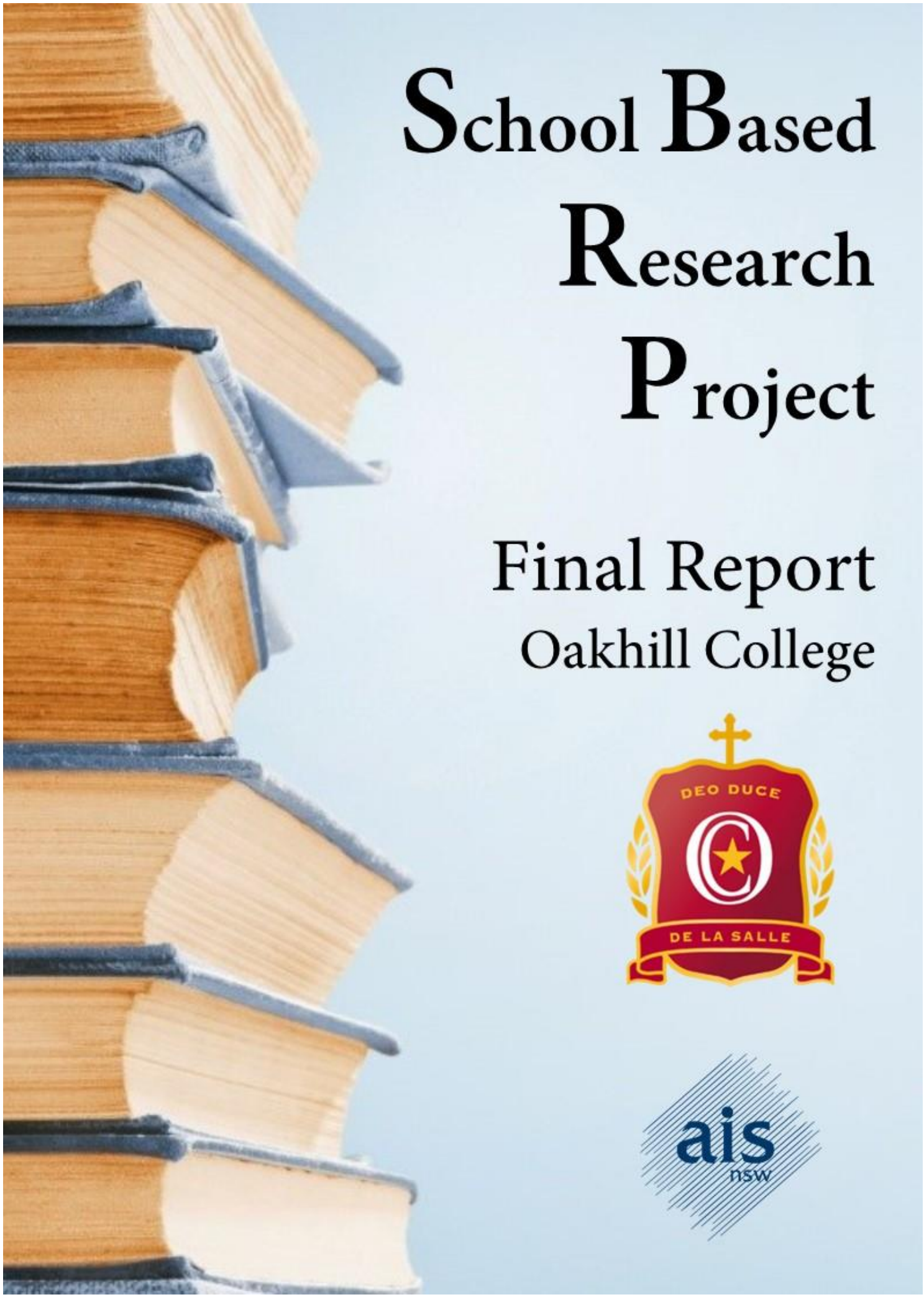

School Based Research Project

Final Report

Oakhill College

Keeping it REAL:

How transparency can lead to an aligned curriculum, student centred pedagogy and improved student outcomes

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Contents

Table of figures

Executive Summary

This report is an investigation of the gaps between the declared, taught and learned curriculum for Years 7 and 8 at Oakhill College, a secondary, mostly-boys school in north-western Sydney. It examines how a policy of transparency and student-centred pedagogy attempted to consider and reduce those gaps, and thus, through encouraging increased curriculum alignment, improve student outcomes.

Numerous research tools were used in this investigation, including focus groups with key stakeholders (teachers, students and parents), tests of students' learning (school assessments, Allwell testing and California Critical Thinking Skills Test) and a variety of longitudinal analyses, informed by the NSW Quality Teaching Framework, one of the pedagogical tools utilised by the College. However, the most significant data sets were generated from 395 classroom observations, recorded over the 18-month period of the project.

The study revealed an extensive number of factors contributing to curriculum misalignment. At organisational level, established structures (for example rigid timetabling, traditional buildings, soft and hard ICT systems, and often government regulatory requirements) regularly restricted the school's ability to achieve quality alignment. Who was involved, a teacher's identity and level of self-efficacy, other phenomena expressed discretely at whole-school, department, and individual levels, (and often in counter intuitively dissociated ways), these were the contributing factors that appeared to be the main determinant of the extent of misalignment between the declared and the taught curriculum. For the students, their learning was confounded by the most number of factors, since they arrive at high school from a range of schools and families, and thus a range of skills and attitudes to learning. However, in spite of these factors, the impact of the school environment and pedagogy was significant in determining student learning, and the amount of information and feedback received, especially regarding what constitutes learning success, was arguably most correlative with students achieving increased growth. Student engagement and active participation were also important in this determinance, but ultimately, as expressions of very complex relationships between teachers, their department's capacity to enable quality practice, the variety of resources available during lessons, and the range of attitudes to

learning and school sustained by students, these factors demonstrated correlations of lower integrity.

Analysis of the data revealed that the website, set up as a primary feature of the project to provide the explicit, detailed and highly-visible curriculum for key stakeholders, did help students improve their learning. However, interventions conducted as a result of data analysis during the study, plus the study itself, manifest throughout the project in the College's learning spaces via its class observations and other research activities, assisted in ensuring greater adherence to the website's declared curriculum. Thus, it is arguable that these factors were significant in diminishing the gaps between the declared, taught and learned curriculum.

Accordingly, this has been a comprehensive study of gaps that occur in the declared, taught and learned curriculum, which has provided information about how students learn, and the environments in which they learn. Furthermore, this resulting data is of a considerable size relative to the resources of this project, and therefore has the potential to enable and inform many other future studies.

Introduction/Background

Oakhill College is a private Catholic secondary school in suburban Castle Hill, part of the Sydney greater metropolitan area. It has 1700 students, all boys, other than 260 girls across Years 11 and 12. The College's performance in commonly referenced standardised measures, NAPLAN and the HSC, over the greater part of the last decade indicated a failure to demonstrate improvement in student outcomes from Year 7 to Year 12. This decline has been at the forefront of several interventions within the College.

The first intervention was the implementation of the Understanding By Design (UbD) framework for curriculum in 2009. This intervention was closely followed by the adoption of the Quality Teaching Framework (QTF) to support the design and evaluation of program and assessments.

When the Australian Government introduced the Digital Education Revolution initiative in 2009 the College embraced the opportunity to purchase 1000 Notebooks stored in charging trolleys within classrooms. Essentially, this initiative failed. Android Tablets started being issued to students on a 1:1 basis in 2012, also with little success.

To a degree, whilst ICT infrastructure was a contributing factor, the main obstacle to including technology in the classroom was the lack of pedagogical change to beneficially utilise it, a phenomenon reflected in the failure to fully adopt UbD or QTF; the majority of teachers and leaders continued to focus on control of the classroom, compliance, and 'ticking boxes' as paramount concerns.

At the start of 2013, Oakhill had a new Principal and the newly formed Innovative Learning Team (ILT). The ILT consisted of the Coordinator of Innovative Learning and two teachers. Upon the Principal's request, the ILT and a wider committee wrote a report into the future direction of 'ICT and Active Learning at Oakhill College'. The committee visited other schools known for their innovation and interviewed some of the leaders within these schools (The King's School, Pymble Ladies College, Coburg Senior High School, Brighton Grammar School, Glen Waverley Secondary College, Tintern Schools, Lilydale High School and Northern Beaches Christian School), conducted a review of academic literature, audited the

existing school environment for ICT capabilities, interviewed ex-students and surveyed staff and students.

The investigation found that for learning to occur in a deep and meaningful way at Oakhill there needed to be a pedagogical shift by teachers to incorporate:

- a reduction of the delivery of content and an increase in concept based, skill driven student activity (less teacher-led class discussion, more small groups solving problems)
- authentic learning embedded in real-world connections, such as using Skype to bring experts to classes
- integration of subjects where there are similar skills and content being taught
- the demands of a technology rich world

Also, assessment tasks needed to be less about knowledge and content, for example, via tests, and more about higher-order thinking and creation through the application of knowledge, such as meaningful projects more aligned to real life activities that cannot be completed via a 'copy and paste' process (Carson et al. 2013).

To kick-start a pedagogical shift, it was decided to concentrate resources through a Year 7 pilot program that the ILT called REAL, an acronym for Relevant, Engaging, Active Learning. It included the following features:

a) Transparency
    i) All teaching programs and assessment tasks to be online for access by all staff, students and parents a term (approximately 10 weeks) in advance, for ease of access, but also as an imperative for all faculties to reach a benchmark standard
    ii) Through access to each other's programs and observations of teaching, staff to learn from each other, develop cross-faculty learning tasks and to collaborate more generally
b) Technology
    i) Each Year 7 student to be allocated with a laptop (instead of an Android tablet).
    ii) Programs and other resources to be provided online via an in-house developed REAL website established in Google Sites
    iii) Students to mainly work in Google Drive (and teachers also be trained to use it)

iv) Teachers to use Hapara, a dashboard for distributing and monitoring students' work in Google Drive, new to Oakhill in 2014
v) Provision of an always on, always accessible, always usable wi-fi network

c) Student-Centred Learning
i) Pedagogical ideals of student-centred learning to be incorporated into faculty programming
ii) Active observation of classes to ensure the declared curriculum was actually being taught and learned

The REAL Program made the declared and taught curriculum visible to all stakeholders in the learning environment and thus intending to make a stronger correlation between the declared curriculum and the curriculum actually taught to students. Furthermore, assessment could also be more effective as a measure of student learning outcomes as the learned curriculum.

This visible curriculum enables teachers to promote in every lesson (a) the learning intentions (b) the planned activities to achieve the learning intentions and (c) how students can demonstrate successful learning. The visibility of the curriculum has allowed closer scrutiny of assessments and as a result, for example, more formative assessment tasks instead of pure summative tasks have been implemented.

Transparency, as it pertains to behaviour, implies openness, communication, and accountability. In an extension of this meaning something described as 'transparent' can be 'seen through', and so does not obscure the objects it sits before (student and organisational learning, bureaucratic process, et al.), enabling truthful understanding of these objects. For the purposes of this study includes:

1. Online curriculum documentation and resources, accessible to all involved stakeholders, faculty, students, and parents
2. Programs, assessment tasks and resources stored in common, accessible cloud-based spaces.
3. Evaluation and feedback of the REAL Program which is accessible to all staff
4. Classrooms that are open to observation at any time without notification by the research team

5. Learning spaces that are highly visible in the physical sense, enabled, for example, through design choices such as in the use of glass instead of solid walls.

Another consideration of REAL was the need to disrupt the majority of teachers from their comfort zone, maintaining control from the front of the room, so they could learn the skills and develop trust in the relinquishment of some of that control, allowing students to take greater responsibility for their own learning.

The shift away from the traditional lecture style instructional paradigm to a more learner-centred classroom was the other essential element to the REAL program design. New pedagogies that build self-regulation, collaboration, critical thinking and transfer of knowledge and understanding needed to become paramount.

Many small-scale interventions have been attempted by the College at cohort, faculty and curriculum level to address the inability to academically add value to the students at Oakhill. A stumbling block in almost all of these innovations was their inception or application at the Stage 6 level. This phenomenon was generally believed to occur as Stage 6 was at once the site of 'highest stakes', and also the site of highest reward, where success seemed both vital and most valuable. Each of these interventions was met with a degree of passive resistance from the great majority of staff and a lack of capacity or unwillingness to engage by students. Most Stage 6 learners, regardless of academic ability, had already constructed a concrete image of effective teaching and learning at Oakhill College which represented 'expert' teachers providing hours of teacher instruction and lecture style presentation with supporting booklets and PowerPoints which were prized and guarded. The role of the student in this was to passively absorb all content, copy notes, accept practice papers and rote-learn or memorise for success. Any modification to these norms was regarded as being counterproductive, obstructive, and even a dangerous risk to HSC success.

The formulation of the REAL program took into account the need to metacognitively prepare students from their first days of high school. The aim would be to deny the 'norm' of teacher-centred lessons, thereby allowing space for a 'new normal', where students take ownership their learning experience. Lessons were to be built on a mix of teacher instruction, collaborative and independent work with students being active in the learning process. Hands-on application of theory and concepts were to be encouraged in even the most abstract subject areas.

Self-regulation was to be encouraged through the adoption of the ‘three before me’ learner principle, inviting assistance from peers, online research, the library, siblings and any other alternatives to the teacher as initial ports of call to problem solving. The idea was that students should understand that learning is hard and that failure is positive and completely necessary for development.

In terms of the broader community, this report aims to demonstrate that when a transparently declared curriculum that promotes visible learning is engaged by faculties and individual teachers in a student-centred practice, there are improved student outcomes.

Literature Review

What does the literature reveal about schools making curriculum transparent and shifting towards a more student-centred pedagogy? What impact does this transparency and pedagogy have on learning?

Introduction

The REAL program is a highly transparent environment of online curriculum delivery and classroom teaching practice, using pedagogy that strives to be student-centred and thus actively engaging students in relevant tasks. The REAL Research Project investigates the impact of the transparency and pedagogy on student learning outcomes. This literature review will therefore examine what educational research has revealed to date about curriculum transparency and student-centred pedagogy in secondary schools. It particularly focuses on the areas of 'deep curriculum alignment', 'visible learning' and the 'new pedagogies'.

Transparent Curriculum

Curriculum Definition

There are many definitions of curriculum. More than just content, the curriculum includes student learning outcomes, teaching and learning activities, and assessment of student learning outcomes (Abate, Stamatakis, & Haggett, 2003, p.5) and has been described as "not simply as an aggregate of separate subjects but rather as a programme of study where the whole is greater than the sum of the parts" (Harden, Davis & Crosby, 1997, p.264). However, "For many educators, curriculum is just a list of goals agreed upon by the organization" (Squires, 2009, p.165). The definition used here, however, comes from Wiles and Bondi (2007):

> *The curriculum represents a set of desired goals or values that are activated through a development process and culminate in successful learning experiences for students.* (Wiles & Bondi, 2007)

Curriculum Alignment

English (1992) seems to have started the curriculum alignment trend with the written, the taught and the tested curriculum. English and Steffy (2001) focused on tests and the importance of 'deep curriculum alignment' to develop stronger links between the taught curriculum and what is actually assessed.

Harden (2001), a researcher focusing on medical education, split curriculum into

1. The "declared curriculum", representing what students are assumed to be learning
2. The "real" or "taught curriculum", depicting what is being delivered to the student
3. The "learned curriculum", representing what is assessed (Harden, 2001, p.124)

Harden (2001) also advocated for all information regarding the curriculum being taught to be shared within a school so that it aligns with the school's overall goals (p.135), in other words, the declared curriculum.

While there has been a great deal of modern research into curriculum delivery, in terms of the 'taught curriculum', there appears to have been very little study into the declaration of intended curricula.

> *How do teachers and students know what is covered in the curriculum and where it is addressed? How do students know what learning opportunities are available to assist them to master each of the expected learning outcomes? How does assessment relate to the teaching programme? What resources are needed to mount each part of the programme?* (Harden, 2001, p.123)

As part of his curriculum mapping, Harden (2001) brought in transparency of curriculum, not only for teachers but also for students to have deeper and broader understanding of what is meant to be learned and how they are to achieve it.

Marzano notes that "the possible discrepancy between the intended curriculum and the implemented curriculum comes as a surprise to non-educators and educators alike." (Marzano, 2003, p.22). He references Hirsch in explaining that the idea of a "coherent implemented curriculum is simply accepted on faith...however, most who hold this notion find that is a myth" (Hirsch, 1996, p.26 in Marzano 2003, p.22).

This gap between the intended and implemented curriculum has been found by many researchers:

> *The main flaw with curriculum is that of individual variation between teachers. Because individual teachers decide how and when to teach the standards (goals), no two teachers will produce the same results, and the risk for large variations in test scores between teachers increases significantly*. (Squires, 2009, p.142)

Additionally, English (1987) claimed teachers "use two things to make day-to-day content decisions about curriculum: their own ideas and the textbook" (p.50). Therefore, not only is there a gap between the declared and taught curriculum but also amongst teachers in what they are teaching.

An Australian study by McNeill, Gosper and Hedberg (2011) revealed higher education course convenors described an intention for outcomes involving higher order thinking but assessment strategies did not match these intentions, mainly due to the time that would be required for marking and personalised feedback (p.682). There was a move to implement technological tools to help this process but again these tools were used for more basic checking of student progress, such as comprehension tests to ensure they had completed their set readings (p.683).

Britton, Letassy, Medina and Er (2008) wrote about an overhaul in the curriculum of pharmaceutical education. They found that collaboration of staff and a transparent curriculum via an electronic data system enabled a switch of curriculum emphasis from content to a stronger focus on what students should be able to do (as opposed to merely know). Consequently, they proposed that the electronic data system formed stronger alignment between the prescribed curriculum, what was taught and how it was taught. As Spencer, Riddle and Knewstubb (2012) noted, however, this study did not also assess if the declared curriculum also aligned with the learned curriculum and really did not provide much evidence for the alignment to the taught curriculum either (p.219).

There appears to be recognition that something needs to be done about the gaps between the declared, taught and learned curriculum and that a computer network could assist in narrowing these gaps. Otherwise, solutions for closing the gap are noticeably absent. Perhaps if teachers collaborate and agree on the curriculum to be taught and how it will be taught the learning outcomes will also be more consistent with the declared curriculum.

Visible Learning

Following the notion of meta-analysis as developed by Gene Glass in 1976, John Hattie converted a wide range of prior research that had investigated various educational actions into their strength of impact, better known as their "effect sizes". The effect sizes extrapolated from these studies have repeatedly and constantly been used to judge on what is really making an impact on student learning and achievement, including the 'Six Signposts to Success'. The fourth signpost states:

> *Teachers need to know the learning intentions and success criteria of their lessons, know how well they are attaining these criteria for all students, and know where to go next in light of the gap between student' current knowledge and understanding and the success criteria of: "Where are you going?", "How are you going?", and "Where to next?".* (Hattie, 2012, p.22)

Hattie clearly indicates that the impact of the teacher is central to a controllable mechanism in student improvement and that only systems that harness this improvement can continue to be sustainable and successful. He notes the notion of controllable variance in teachers, and in quoting 2013 PISA results, articulate a 34% variability between schools in OECD nations while reflecting a 64% variability of teacher effectiveness within schools (Hattie, 2015, p.2). Even the best teachers have variability in their effect on students. Schools need to use their "dependable evidence" to "make decisions about how they teach and what they teach (Hattie, 2012, pp.169-170). Learning intentions and success criteria that are accessible and visible to students are integral to any progress in learning and "our role is to make this learning more transparent, so that it can be critical in driving decisions". (Hattie, 2012, p.170).

It is clear that teachers are pivotal to the learning success of students and yet the methods they employ and the curriculum they implement varies considerably, even within the same school. Hattie's visible learning principles may help to close the gaps contained in curriculum alignment and technology can help make all aspects of the curriculum transparent to the stakeholders involved.

It appears the principles of Hattie's 'visible learning' can help to close the gap between the intended, taught and learned curriculum. The next question is then if there is consensus that there is a need to have curriculum alignment, how should the learning of that curriculum occur?

Student Centred Pedagogy

Linking curriculum alignment with a shift in pedagogical focus, Biggs (2003) promoted "constructive alignment" meaning that teaching should be about establishing an environment for learning so that students construct meaning for themselves and like Britton et al (2008), outcomes are less about topic content but the understanding achieved. Hattie, as noted above, also advocates students constructing their own knowledge and ideas.

Baeten, Kyndt, Struyven and Dochy (2010) reviewed literature for factors influencing deep learning approaches. They referenced Dochy et al (2002) to summarise the characteristics of student-centred learning as:

1. An activity and independence of the student
2. A coaching role of the teacher
3. Knowledge which is regarded as a tool instead of an aim

This literature study had inconsistent results regarding the influence of student-centred environment on deeper approaches of students towards learning. However, they did find the following perceived contextual factors had an encouraging effect on deep learning approaches.

Students should be satisfied with the:

- *Overall course quality or specific features of the course/learning environment*
- *Appropriateness of the amount of information*
- *Quality of the teaching*
- *Supportiveness of the teacher*
- *Clarity of goals and standards* (Baeten, Kyndt, Struyven & Dochy 2010 p.252)

Much of the literature presents student-centred learning (teachers as mere facilitators) in a dichotomy with teacher-centred learning (teachers as lecturers transmitting knowledge) but Mascolo (2009) argues for a balance where learning is through "guided participation", as invoked by Rogoff (1990, 1993, 1995). This shifts the thinking back to a centre so that teachers are not just coaches as per Dochy et al (2002) in Baeten et al (2010) but scaffold processes and provide clear goals within which students actively construct their learning.

Mayer (2004) wanted to be clear that student-centred learning should not be an anarchy of free learning by students. Instead, he stated:

> *The constructivist view of learning may be best supported by methods of instruction that enable deep understanding of targeted concepts, principles, and strategies—even when such methods involve guidance and structure. In short, there is increasing evidence that effective methods for promoting constructivist learning involve cognitive activity rather than behavioural activity, instructional guidance rather than pure discovery, and curricular focus rather than unstructured exploration.* (Mayer, 2004, p.14)

Hannafin, Hill and Land (1997) examined student-centred approaches ("rooted in constructivist epistemology" p.94) in an "interactive multimedia" context. They argued that "the student must be empowered and supported while making purposeful use of the tools, resources, and activities in the environment - skills for which many students are ill-equipped" (p.97). They go on to suggest that feedback and both student and teacher reflection are an important component of student-centred learning. Marzano (2003) found in his literature review that part of the student-centred environment advocated by researchers are setting clear goals and providing effective feedback (Marzano 2003, p.35). According to Hattie and Timperley (2007), feedback should involve "three major feedback questions: Where am I going? How am I going? and Where to next?" and address "the task, the processing, the regulatory, and the self" (p.102). This is supported by Mascolo (2009) who claims "These forms of feedback promote increasingly higher-order skills that contribute to the development of self-regulated learning" (p.20).

These student-centred learning ideals have been brought together in a term coined by Fullan and Langworthy (2014) as "new pedagogies" which they define as:

> *A new model of learning partnerships between and among students and teachers, aiming towards deep learning goals and enabled by pervasive digital access.* (Fullan and Langworthy, 2014, p.2)

They present "deep learning" as students actively participating in a learning process that connects and contributes to the real world (p.3) and, like Hattie (2015), learning goals (Fullan and Langworthy, 2014, p.28) and quality feedback is vital:

> *In the new pedagogies, feedback between and among teachers and students stands at the critical nexus between learning goals...and deep learning outcomes*. (Fullan and Langworthy, 2014, p.16)

These “new pedagogies” continue to push for a reduction in the amount of direct instruction from teachers in a classroom and values what students are able to do, not just what they know, fitting in a world where information is readily available to all and sundry.

It is clear from these researchers that student-centred learning involves a balance of learning through self-discovery but with guidance through goal-setting, guidance and constructive feedback.

Abate, Stamatakis and Haggett (2003) argued that since learning is the main focus of education, then the outcomes and thus the assessment must be the driving force behind curriculum and pedagogical development (p.15). This matches the ‘Understanding by Design’ (UbD) philosophy of Wiggins and McTighe (2005) involving ‘backward design’ where first the desired results are identified and then the evidence of achieving those results are determined. Once these goals are set, then the teaching methods are planned. Big picture of curriculum is set and then driving questions steer the learning (Wiggins and McTighe, 2005, pp.17-19). It promotes big ideas, essential questions and understanding instead of a series of knowledge pieces. These are key components of student-centred learning.

Conclusion

Oakhill College was already purporting to operate under the UbD system of design with programs of curriculum written to comply with UbD philosophy. However, the essentially student-centred approach of UbD was not penetrating through to assessments and class tasks. Lessons were still being based on mere knowledge and superficial learning, delivered by a teacher from the front of a classroom. In other words, there was a gap, better described as a chasm, between the declared curriculum and what was actually implemented. This literature review reveals that Oakhill is not alone in its issues with aligning the declared, taught and learned curriculum. Due to this gaping hole, a pilot program was designed called REAL (Relevant, Engaged, Authentic Learning) to implement more deep learning pedagogy in classrooms through a transparent curriculum based on the principles of visible learning.

The question that arises from this is just how effective will this transparent approach be? Will it actually improve learning outcomes?

Aims and Research Questions

The REAL Program intervention was designed to create a quality learning environment featuring transparent curriculum for students to achieve successful outcomes.

This study aims to demonstrate that a concentrated focus on visible learning pedagogy, by teachers being collaboratively involved in planning lessons that target cognitive, emotional and behavioural engagement in students, will meaningfully achieve the desired outcomes. The impact on student outcomes in terms of this study is extended beyond student academic achievement to include independence, engagement, critical thinking skills and attitudes to learning.

All of these factors are considered in the research questions:

In what ways is student learning affected by curriculum transparency and a shift towards student-centred pedagogy?

Does this transparency and student-centred pedagogy support a stronger correlation between the declared, taught and learned curriculum for students?

It is the hypothesis of the research project that there is greater alignment between the declared, taught and learned curricula when the learning environment is more visible to the learner and the pedagogy is student-centred. Additionally, it is proposed that lessons encouraging engagement in activity, collaboration and creation in a transparent environment fosters self-regulated, collaborative and critically thinking students.

These outcomes are measured via school-based assessment, the Placement/Progress Allwell Test and the Californian Critical Student Thinking Test.

Methods and Data Collection Approaches

Methodology:

This mixed methods study will address the impact on student outcomes of transparency in declaration of curriculum and classroom practices as well as a shift in pedagogical practice to a more learner centred environment. A triangulation mixed methods design will be used, and it is a type of design in which different but complementary data will be collected on the same topic:

Quantitative Measurements

- To measure student learning, quantitative data from the California Critical Thinking Student Test, the Placement/Progress Allwell Test and school-based assessment will be used
- The Quality Teaching Framework Assessment Tool (Appendix ix) will quantify assessment tasks for their intellectual challenge, task significance and quality learning process by comparing assessment tasks pre-REAL (2013) and again during the intervention over a period of 6 terms (18 months)
- Student engagement surveys (Appendix vi) assess how students view themselves as learners in terms of behaviour, emotion and cognitive ability

Qualitative Measures

- Student, staff and parent focus groups are being conducted over a period of 6 terms (18 months) through focus groups and surveys to reveal detailed individual insight from participants as to their interaction with various facets of curriculum, teaching approaches, student learning, assessment tasks and the College in general

Quantitative and Qualitative Measures

- Teacher practice and self-efficacy surveys will have both quantitative and qualitative questions to determine teaching strategies being used, perception of teacher effectiveness and perceptions of the general school environment

- Lesson observations (Appendix viii) based on the 'Visible Learning' framework of success criteria will provide the most comprehensive qualitative and quantitative data to assess the implementation and effectiveness of the REAL Program across all faculties teaching Year 7 (2015) and subsequently the Year 8 (2016) cohort during the intervention over a period of 6 terms (18 months).

Table 1 - Data Summary

In what ways is student learning affected by curriculum transparency and a shift towards student-centred pedagogy?	
What counts as evidence?	**Data source**
● knowing when one (teacher and student) is successful in attaining these goals; understanding the critical role of teaching appropriate learning strategies	● Student & teacher surveys ● class observations
● teachers planning and talking about teaching	● lesson observation of REAL classes
● ensuring the teacher constantly seeks feedback information as to the success of his or her teaching on the students	● class observations ● QT analysis of Year 7 assessment tasks pre-REAL and post-REAL
● student demonstrate as emotionally, cognitively and behaviourally engaged in their learning	● engagement survey ● class observations ● parent focus groups ● student focus groups
● students demonstrate growth in critical thinking	● critical thinking measures CTTST
● students demonstrate growth in learning outcomes in testing	● Allwell testing ● attitudes to learning from academic reports

Does this transparency and student-centred pedagogy support a stronger correlation between the declared, taught and learned curriculum for students?	
What counts as evidence?	**Data source**
● developing a curriculum that aims for a best balance of surface and deep understanding	● class observations ● QT analysis of Year 7 assessment tasks pre-REAL and post-REAL
● ensuring a focus on developing learning strategies to construct meaning	● class observations ● Year 7 assessment tasks pre-REAL and post-REAL
● having strategies that are planned, deliberate, and having explicit and active programs that teach specific skills and deeper understanding	● class observations ● QT analysis of Year 7 assessment tasks pre-REAL and post-REAL
● paying deliberate attention to learning intentions and success criteria; setting challenging tasks	● QT analysis of Year 7 assessment tasks pre-REAL and post-REAL ● class observations
● providing multiple opportunities for deliberative practice	● class observations ● QT analysis of Year 7 assessment tasks pre-REAL and post-REAL
● students demonstrate growth in learning outcomes in school assessment	● QT analysis of Year 7 assessment tasks pre-REAL and post-REAL ● 2015 and 2016 reports
● students demonstrate growth in learning outcomes in standardised testing	● Allwell testing

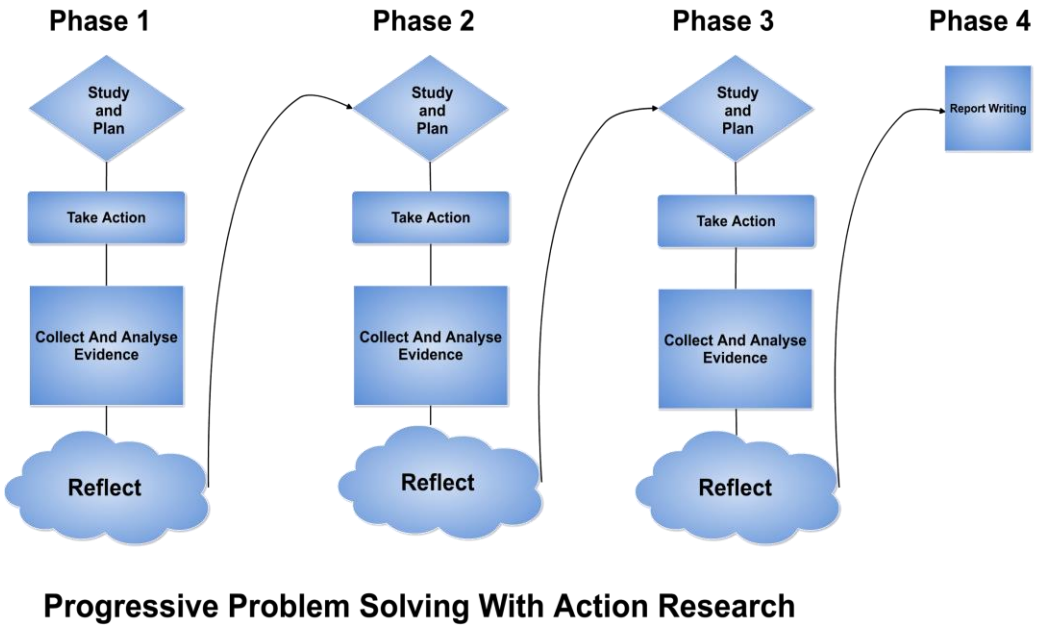
All these measurements cumulatively test the theory that transparency and student-centred learning improves alignment between the declared, taught and learned curricula, as well as encourages greater student self-regulation through student-centred pedagogy, and thus positively influences the outcomes for the Year 7/8 cohort of at Oakhill College across the

two years, 2015-2016. Collecting both quantitative and qualitative data brings together the strengths of both forms of research to validate results and thereby providing more explicit findings.

Research design:

During the implementation of the REAL Program Pilot in 2014, there were several changes, additions and improvements. As the term 'pilot' would suggest, there was plenty of room for development of the program in practice. The acknowledgement that this development would continue to occur during the research project forecast the study to take the form of technical action research. Using the Riel Model, as indicated in *Figure 1*, there were three key cycles or phases of research and planning, action, data collection, analysis and reflection.

Figure 1: Riel's Model of Action Research



Under the guidance of the project's mentor, Professor James Albright from the University of Newcastle, the project has been broken into four phases:

- Phase 1 - Semester 1 2015: Data collection and Analysis
- Phase 2 - Semester 2 2015: Data collection and Analysis
- Phase 3 - Semester 1 2016: Data collection and Analysis

- Phase 4 - Semester 2 2016: Report Writing and Presentation of Findings

The AISNSW REAL Research Project Team worked on sectioned out areas of the project as a part of an allocated allowance from the college or out of interest. It is extremely important that there was a significant representation of teachers who originally worked on the *Creating Critical Minds at Oakhill Report* to maintain the vision and integrity of the project.

In the early scaffolding of the project it was believed that the Year 7 2015 cohort would be studied against a control group but after the advice of several academic advisors that there could be no effective control group, this was changed. Thus the focus of the study is the Year 7 2015 cohort through to Semester 2, Year 8 2016. It is the intention of the College to continue the research process beyond 2016 and will seek to find funding to support this data collection, analysis and reporting.

The decision to use the Concurrent Triangulation Design Model for data collection and analysis was made to ensure that there was as accurate a read as possible of the impact of the REAL Program on student outcomes during a relatively short study in terms of demonstrating growth. With 18 months to monitor the program and student outcomes, there could be many contributing factors that impact on the participants of the study, particularly the transition from primary school to high school. By using quantitative and qualitative measures throughout all three phases of data collection there was a deliberate approach to analyse both forms of data prior to interventions and when determining findings, taking into account all possibilities and information to strengthen arguments.

Table 2 - Research Timeline

Activity	Time Period
Collection of Pre-REAL Year 7 Programs & student assessment samples	**Term 1 - Weeks 2-5**
Analysis of Pre-REAL Year 7 Programs & student assessment samples	**Term 1 - Weeks 5 - 10**
Class Observations Year 7	**Term 1 - Weeks 3 - 9**

Student Focus Groups Year 7	**Term 1 - Week 8 & 9**
Year 7 Parent Focus Groups	**Term 1 - Week 9**
PD Intervention 1 - Setting learning intentions and success criteria	**Term 1 - Week 10**
CTTST (Critical thinking pre-test)	**Term 2 - Week 2**
Collection of REAL Pilot 2014 Year 7 Programs & student assessment samples	**Term 2 - Weeks 1 - 4**
Year 7 Staff Focus Groups	**Term 2 - Week 4**
Pd Intervention 2 - Setting high expectations through success criteria	**Term 2 - Week 4**
Analysis of REAL Pilot Year 7 Programs & student assessment samples	**Term 2 - Weeks 5 - 9**
Class Observations Year 7	**Term 2 - Weeks 2 - 8**
Class Observations Year 7	**Term 3 - Weeks 2 - 9**
PD Intervention 3 - Visible Learning Strategies	**Term 3 - Week 6**
Year 7 Allwell Testing	**Term 3 - Week 7**
Preliminary Report Writing	**Term 3 - Weeks 7 - Term 4 - Week 1**
Collection of REAL 2015 Year 7 Programs & student assessment samples	**Term 4 - Weeks 1 - 8**
Analysis of REAL 2015 Year 7 Programs & student assessment samples	**Term 4 - Weeks 4 - 9**
Class Observations Year 7	**Term 4 - Weeks 1 - 4**

Year 7 student focus groups	**Term 4 - Weeks 1 - 7**
PD Intervention 4 - Quality Assessment	**Term 4 - Week 4**
Staff focus groups	**Term 4 - Week 5**
Surveys Year 7 staff	**Term 4 - Weeks 5 - 9**
Year 7 parent focus groups	**Term 4 - Week 6**
School-based CAT literacy/numeracy test 2015	**Term 4 - Week 8**
PD Intervention 5 - Effective Feedback	**2016 Term 1 - Week 1**
Engagement Post Test	**2016 Term 1 - Week 1**
Class Observations Years 7 & 8	**2016 Term 1 - Weeks 3 - 9**
PD Intervention 6 - Embedding the Oakhill Learning Framework through Instructional Rounds	**2016 Term 2 - Week 1**
Class Observations Years 7 & 8	**2016 Term 2 - Weeks 1 - 8**
Collection & analysis of Alwell data 2015	**2016 Term 2 - Weeks 5 - 9**
CTTST (critical thinking post-test)	**2016 Term 2 - Week 1**
Focus Groups of students, staff and parents	**2016 Term 2 - Weeks 1 - 4**
Analysis of surveys	**2016 Term 2 - Weeks 5 - 9**
Year 8 Allwell Testing 2016	**2016 Term 3 - Week 7**
Report Writing	**2016 Term 3 - 2016**
Report & presentation to AISNSW due	**October 2016**

Intervention design:

Over the course of the project there were six targeted interventions to support transparency and more student-centred pedagogy. Each intervention included:

- a general broadcast at a staff meeting of an observed trend from the project data collection and analysis, an overview of research used to support the planned intervention and an outline of the intervention
- at least one participant from each faculty in the project to attend a whole day professional development that was designed to be scaled across the REAL Program teaching staff for implementation in the delivery of the declared or taught curriculum
- each intervention professional development day included instruction on the research base, discussion of the data used to inform the intervention, collaborative planning of the intervention and independent work time to support adoption by the faculty.

There were several reasons for the small group approach to professional development interventions. The first reason being that in a school the size of Oakhill, it is virtually impossible to plan a whole staff professional learning day outside of the College timetabled staff development days which are put in the calendar 12 months in advance. Secondly, holding multiple staff days during school time is costly and can prove disruptive to the learning environment. Finally, since the research project was working in the junior years of the school, there were some staff who chose to disengage from the professional learning linked to the project as they believed (incorrectly), that it was of no benefit to their current teaching practice. Having a whole staff approach in these circumstances may not have been well received by non-REAL Program teachers.

The practice for designing each intervention came after analysis of classroom observations, focus groups and programs/assessments. The research team under the guidance of their mentor would identify trends within the data and plan an approach to intervene in the area of concern.

The six identified areas for intervention were:

1. Transparent teaching does not just include declaring the lesson activities and resources. For learning to occur, *a student must be able to access the learning intentions and success criteria* for each set of learning experiences.
2. An inconsistent application of learning expectations for students makes it difficult for *learners to understand what it takes to be successful in learning*.
3. Effective learners are able to see what they are learning, how they are learning and the *strategies students need to employ when they "get stuck"*.
4. A collective understanding of *quality assessment* must be understood and applied by faculties to develop consistency and improve student learning outcomes.
5. *Feedback* is essential to enable learners to know "where they are, how they are going and where to next".
6. A *shared language, vision and practice* around learning will develop professional learning and thus outcomes for students.

Intervention 1 - Learning Intentions and Success Criteria

Learning Intention:

- To embed the practice of declaring learning intentions and success criteria in all lessons.
- To make transparent these learning intentions and success criteria.

The Success Criteria:

- We will have a more functional and declarative scope and sequence that includes learning intentions and success criteria for each lesson/week of lessons.
- Create a plan for ensuring connection between teaching practice and the scope and sequence in our faculties.

Number of participants: 13 teachers (1 per faculty, 2 members of research team)

Outcome:

Each faculty representative worked to create the improved lesson scope and sequence template as a group. Each faculty (with the exception of TAS whose representative was absent on the day), created the Term 1 Scope and Sequence in the new format. The new scope and sequence adopted the visible learning notions of learning intention and success criteria.

Intervention 2 - Setting High Expectation using Success Criteria

Learning Intention:

- To embed the practice of declaring and deconstructing high expectations for learners and success criteria in all lessons.
- To make transparent these expectation and success criteria.

The Success Criteria:

- We will design learning opportunities that allow learners to understand challenge in learning and success criteria for each lesson/week of lessons.
- Create a plan for ensuring connection between teaching practice and setting high expectations for learners and providing samples and success criteria.

Number of participants: 13 teachers (1 per faculty, 2 members of research team)

Outcome:

Each faculty representative worked to create an activity that used a success criteria to support an upcoming assessment. The results of this day were varied depending on the representative. Some faculties that created exemplary work were Science and Visual Arts who built into their learning design, resources and activities that provided scaffolding and exemplars for the unit assessment.

Intervention 3 - Using Visible Learning to Teach Learning Strategies

Sixteen staff from targeted faculties and student support attended the ACEL Visible Learning Symposium (6th August 2015) to have a hands-on opportunity to learn about metacognition and its importance in the explicit teaching of learning.

Learning Intention (from ACEL Visible Learning Symposium):

- To learn about the most impactful learning strategies and how they can unlock learning.
- To find out about the ways you learn, so you can see learning through the eyes of your students.
- To have a toolkit of effective learning strategies.

The Success Criteria:

- An Oakhill College Learning Strategies Model which embeds strategies for explicitly teaching about learning in key faculties which will hopefully filter through in subsequent whole school professional development.

Number of participants: 18 teachers (3 representing 5 targeted faculties, 1 member of research team, 2 Senior Leadership Team members)

Outcome:

The introduction of the concept of metacognition to all staff released through a staff meeting presentation initiated discussion of learning strategies and their place in learning design.

A concept map was developed of student learning strategies that teachers can actively embed in their Year 7 program for Term 4. This concept map will be a part of the College student diary as a point of reference for all students and teachers. We have also developed a Matrix of Learning Strategies for teachers highlighting the specific learning strategies that should be targeted for each year group and embedded in the programs. This matrix/guide will underpin the Oakhill Learning Framework as the pedagogy, processes and philosophy of the REAL Program move throughout the College.

Intervention 4 – Using the Quality Teaching Framework to Evaluate Assessment

Learning Intention:

- To develop tasks that effectively assess the learning of our students and prepare them to think critically using the QTF.

The Success Criteria:

- We will know that we have successfully developed tasks that effectively assess the learning of our students when we can see significant increases in our scores using the QTF assessment tool, particularly the intellectual quality domain.

Number of participants: 13 teachers (1 per faculty, 2 members of research team)

Outcome:

This intervention was informed and led by our project mentor Professor James Albright who has had a long association with the Quality Teaching Project. All participants were taken through the connection of our project with the QTP and were trained in the application of the Quality Teaching Framework Assessment analysis instrument. As a result of this intervention, all Year 7 assessment tasks for 2015 were analysed using the Quality Teaching Framework Assessment analysis instrument. Analysis was begun during the intervention and completed in a follow-up faculty meeting to build a shared understanding of quality assessment and identify particular areas of strength and those in need of development.

Further information about the analysis of assessment can be found in the findings section of this report and in the appendices.

Intervention 5 – Knowing our impact – The Power of Feedback

Standard 5 - Assess, provide feedback and report on student learning

5.1 Assess student learning

5.2 Provide feedback to students on their learning

5.3 Make consistent and comparable judgements

5.4 Interpret student data

Learning Intention:

Proficient:

- To acknowledge the growth mindset that we are all learners in a constant cycle of feedback and explore a considered definition of feedback.

- To explore the notion of teacher impact on student achievement and consider the role of feedback on student achievement.
- To learn the 12 elements of feedback and consider the three effective questions and four levels of feedback suggested by Hattie and Timperley.

Highly Accomplished:

- To acknowledge the growth mindset that we are all learners in a constant cycle of feedback and explore a considered definition of feedback.
- To explore the notion of teacher impact on student achievement and consider the role of feedback on student achievement.
- To learn the 12 elements of feedback and consider the three effective questions and four levels of feedback suggested by Hattie & Timperley.
- To connect with the eight principles of effective feedback use outlined by Hattie and Gan.

Lead:

- To acknowledge the growth mindset that we are all learners in a constant cycle of feedback and explore a considered definition of feedback.
- To explore the notion of teacher impact on student achievement and consider the role of feedback on student achievement.
- To consider the impact of 'system thinking' on cultural change in a school and how this might challenge Oakhill in terms of reinforcing as well as balancing process in the face of delayed effects.
- To use the work of Fullan and Langworthy (2014) around new pedagogies and the role of feedback in this new learning paradigm to create a plan for implementation of a shared language and process scaffold for feedback.

The Success Criteria:

Proficient:

- I can articulate a connection to some the 12 elements of feedback in my own practice.

- I have created a plan to embed Hattie's three prompt questions for feedback in my practice.
- I have chosen one effective strategy to implement in my practice.
- I have unpacked, with support of my colleagues, our shared language of feedback.

Highly Accomplished:

- I can demonstrate a connection to the 12 elements of feedback in my own practice.
- I have shared my experience of using Hattie's three prompt questions for feedback in my practice.
- I have evaluated effective strategies of feedback used in my practice.
- I have made a plan to investigate further, the leading principles of feedback in terms of my own professional development.
- I have invested in faculty dialogue with my colleagues, representing our shared language of feedback.
- I have demonstrated my understanding of feedback through mentoring my peers.

Lead:

- I have demonstrated my deep understanding of elements, principles and processes of feedback in my faculty and broader school context.
- I have actively engaged in the development of a whole school approach for the implementation of a shared language of feedback.

Number of participants: Entire College teaching and non-teaching staff

Outcome:

This was a whole school intervention, all teaching and non-teaching staff participated in an effort to build a culture of learning through feedback. Participants took part in a preparation activity that enabled them to self-assess their understanding of feedback. The results of this self-assessment were used to differentiate the professional learning on offer and make for a more tailored professional learning experience. Participants were able to access all material in an online portal, attended a mix of discussion sessions, practical workshops and reflective opportunities to continue to build a shared language around learning and in particular, feedback.

As a result of the intervention there was a renewed focus on the provision of effective feedback and an ongoing dialogue with staff as to types of feedback we give, the difference between praise and feedback and how to build formative tasks with opportunities for feedback.

Intervention 6 – Embedding the Oakhill Learning Framework through instructional Rounds

Standard 6 – Engage in professional learning.

Standard 7 – Engage professionally with colleagues, parents/carers and the community.

6.2 Engage in professional learning and improve practice

6.3 Engage with colleagues and improve practice

6.4 Apply professional learning and improve student learning

7.4 Engage with professional teaching networks and broader communities

Learning Intention:

- Through the practice of Instructional Rounds, we aim to embed a framework for an effective lesson (learning intention, success criteria, high expectations, feedback), into every lesson at Oakhill College.

The Success Criteria:

- We will know that we have successfully embedded our framework, when we can consistently see evidence of the four framework markers in lesson observations.

Number of participants: 25 teachers (participants identified as leaders in feedback intervention, including 4 members of Senior Leadership Team and Academic Heads, Pastoral Deans, College Executive members, 2 members of research team)

Outcome:

The final intervention of the project was designed to develop an awareness of key indicators of the transference of the REAL program/OLF. Those staff who indicated that they were in the LEAD or HIGHLY ACCOMPLISHED group for the feedback intervention were trained as Instructional Rounds leaders (20 staff). This group of staff provided a small group briefing to the entire faculty. They completed a week of instructional rounds after all staff were briefed on the process, invited to consult on their concerns and were provided with professional readings and resources to help build their understanding.

An analysis on the trial week of Instructional Rounds was shared with staff as an opening to a whole staff day on professional improvement in Term 3, 2016. All teaching staff have been allocated on a roster for Instructional Rounds groups that will operate in Terms 3 and 4.

Along with the six formal interventions funded by the research project, all curriculum staff development days over the 18 months of the project linked with pedagogical concepts from the REAL Program.

- **Term 1 2015**: What is Relevant, Engaged and Active Learning?
- **Term 2 2015:** How can each faculty support the Quality Teaching Framework objectives through programming and assessment?
- **Term 4 2015:** Formal Launch of Oakhill Learning Framework and the supporting Targeted Learning Strategies Matrix for Stages 4 & 5 – a series of 7 individual off-site faculty days
- **Terms 1- 4, 2015:** REAL Program Faculty planning days:

Faculty	Planning Days
Maths	3
TAS	4
Languages	1
HSIE	1
Religion	1
Visual Arts	1

There were also five strategic interventions within the College to counter variables from the first phase of the research project:

1. The implementation of a cross-curricular Year 7 Transition Program in Term 1, 2016, combining English, RE and PDHPE to reduce the subject workload and assessment burden for students, more coherently engage with pastoral issues that arise in the transition from primary to secondary schooling and to establish an early, consistent and 'best practice' experience for teachers and students.
2. The implementation of the Oakhill Learning Framework BOSTES endorsed online professional development course to provide more systematic and consistent professional development opportunities for staff, both allowing greater coherent participation by staff, whilst also satisfying college-wide and individual professional learning obligations.
3. The adjustment to teacher allocation from 39.4 to 36.4 periods per cycle recognises the inherent need for time to allow appropriate, high-quality collaboration and pedagogical design.
4. The re-design of the REAL Website to simplify the fundamental 'point of contact' students, teachers and parents have with the framework and thereby minimise confusion and increase capacity.
5. Parent and Student REAL Workshops in Term 1 2016 to better inform parents and students of their roles and responsibilities and develop improved skills to allow for increased capacity, particularly in the case of students' early adoption of the Google Apps for Education tools.

Participants:

In terms of measuring student outcomes, the research participants for this report were the Year 7/8 cohort of 2015/2016. This cohort is made up of 240 students ranging in age from 11 years at the beginning of the research project to 13 years at the culmination of the research period. In terms of comparison with other cohorts at the College, they are fairly typical, however demonstrate slightly more capability in terms of literacy and numeracy than the pilot cohort when using Allwell testing as a part of their induction process.

In terms of student outcome data, not all students were available in each measurement cycle for a variety of reasons including extended periods of illness or leave. There was a total of 100 students included in focus groups, five students in each focus group in each of the three phases of data collection. After the rich quality of data from the student voice in Phase 1, the research team was encouraged to include more students in the focus group process to reflect the pedagogical shift towards student-centred learning which privileges student choice and voice.

Table 3 - Collection Data

Data Collection Phase	Number of Focus Groups	Number of Students	Total Students
1	**4**	**5**	**20**
2	**8**	**5**	**40**
3	**8**	**5**	**40**

There is some reference to the Year 7 cohort 2014 in terms of their involvement in the pilot of the REAL program and their performance in two cycles of standardised testing through NAPLAN. These references are not extensive and serve to demonstrate the continuum of the program in application.

Other participants in the research project are the teachers of Year 7 2014 - 2016 as well as teachers of Year 8 in 2016. All teachers of these cohorts were observed over the course of the study as well as surveyed in terms of their perceptions of their practice. These teachers

were placed on the relevant classes randomly, due to their best fit in terms of load and timetabling. The teachers for the program were not selected on a criteria.

Over the course of the 18 months of data collection there were 122 individual teachers observed. Therefore, in terms of teaching staff used in the study, there were a core of 122 teachers. These teachers covered a balance of gender, age and experience as well as years of teaching at Oakhill College. The 63 teachers who had taught one full school year in the program were surveyed at the end of the first year of data collection. A sub-group of 19 teachers was surveyed in Phase 3 of the data collection process since they had been involved from the initial pilot of REAL and had taught each year of the research project cohort. Another participatory subgroup of teaching staff used in the research project were those staff involved in the various professional development interventions. There were five small group targeted interventions, where a total of 82 teaching staff received professional development linked to the declared, taught or learned curriculum. Finally, as indicated in Table 4 below, 36 members of the 122 possible teachers from the REAL Program over the 18 months of data collection were interviewed in focus groups.

Table 4 - Teacher Focus Groups

Data Collection Phase	Number of Focus Groups	Number of Teachers	Total Teachers
1	2	6	12
2	2	6	12
3	2	6	12

The final group of participants were parents of the students involved. There was a total of 36 parents interviewed, 12 parents in each of the three phases of data collection. The parents were a balance of male/female and age-range. There was a mixture of stay at home parents, business owners and professionals. There was also a mixture of parents who did and did not have other students at the College.

Table 5 - Parent Focus Groups

Data Collection Phase	Number of Focus Groups	Number of Parents	Total Parents
1	2	6	12
2	2	6	12
3	2	6	12

Recruitment:

Participants in the research project were recruited in a variety of ways best reflected in the table representing *Figure 2.*

Figure 2: Research Project Participants

Participants	Recruitment Procedure	Consent Procedure	Consent Form
Year 7 2015/ Year 8 2016 student cohort	All student results are used as a part of whole school academic and reporting program.	Student data gathered as a part of school testing procedure, BOSTES and government requirements	Appendix (ii)
Student Surveys	All students were surveyed as a part of a pastoral care activity.	Consent was secured as a part of digital survey tool.	Appendix (vi)
Student Focus Groups	Students were personally approached by the research team.	Verbal consent was secured and recorded in video, sound recording and typed confirmed as a part of the transcript of interview.	Appendix (iv)
Year 7 2015 and 2016/ Year 8 2016 student	All teaching staff provide a wish list of subjects and year groups to teach,	All teaching staff were available for observations as a condition of original	

cohort teaching faculty for lesson observations	these are then considered by faculty heads and the timetabling team.	employment contracts.	
Teacher Survey	All teachers were surveyed as a part of a professional learning expectation.	Consent was secured as a part of digital survey tool.	Appendix (vii)
Teacher Focus Groups	Teachers were personally invited by the research team via email.	Consent was secured as a part of email.	Appendix (v)
Professional Development Interventions	Teachers were suggested by their Academic Head and then personally invited by the research team via email.	All teaching staff were available for professional development as a condition of original employment contracts.	
Parent Focus Groups	Parents were personally invited by the research team via email and follow up phone calls.	Verbal consent was secured as a part of follow up phone calls and then confirmed as a part of the transcript of interview.	Appendix (iii)

Data collection and management:

This research project includes a variety of data sources, which is best reflected in the table representing *Figure 3.*

Figure 3: Data Sources

Data Source	Format	Instrument	Response Format	Source of Instrument	Appendices
Lesson observations	individual scaffolds	digital scaffolds	404 individual scaffolds: - Likert scale - written evidence - counts - yes/no	designed for the project using QTF domains and project metrics	Appendix (viii)
Teacher self efficacy survey	questionnaire	digital survey	108 questions: - 5 short answer - 40 semantic differential scale - 61 Likert type scale - 2 multiple choice	designed for the project using QTF domains, TALIS OECD Teaching and Learning Survey and project metrics	Appendix (vii)
Teacher interview	focus group	interview questions	verbal answers to 9 open ended discussion questions	designed for the project aligned to project metrics and based on the answers from parent and student focus groups	Appendix (xviii)
Student interviews	focus group	interview questions	verbal answers to 10 open ended discussion questions	designed for the project aligned to project metrics	Appendix (xvi)

Data Source	Format	Instrument	Response Format	Source of Instrument	Appendices
Parent interviews	focus group	interview questions	verbal answers to 9 open ended discussion questions	designed for the project aligned to project metrics	Appendix (xvii)
QTF Assessment analysis	Quality Teaching Framework Scaffold	Quality Teaching Framework Assessment Analysis Tool	a scale of 0-5 across three domains and 14 dimensions	NSW Quality Teaching Framework	Appendix (ix)
Lesson timing data	collection spreadsheet	collection spreadsheet	minutes times per teaching lesson	designed for the project aligned to project metrics	Appendix (x)
Student academic report data	semester reports Semester 1 & 2, 2015 Semester 1, 2016	Oakhill College Student Report	coded work habits on a semantic differential scale from never to consistently, marks as a percentage	Sentral reporting system customized for Oakhill College	Appendix (xi)
California Critical Thinking Student Test	individual test	digital test	multiple-choice, short answers	Created by Insight Assessment - California Critical Thinking Student Test for middle school students	Appendix (xii)
Allwell testing	individual paper test 26/8/2015 9/9/2016	placement test report	multiple-choice, short answers, extended writing	External, Robert Allwell - Academic Assessment Services	Appendix (xiii)

Data Source	Format	Instrument	Response Format	Source of Instrument	Appendices
Student engagement survey	questionnaire 20/11/2014 26/7/2016	digital survey	108 questions: - 8 short answer - 100 semantic differential scale	customized for the project from the National Survey of Student Engagement from Indiana University	Appendix (xiv)
Google site analytics	Google analytics reports	Google analytics reports 1/2/2015 - 30/6/2016	- count of page views - Average page views per session - Average session time - count of sessions - count of users	Google Analytics	Appendix (xv)

All data for the research project was centrally stored in the College Google Drive, which was accessible only to the research team including the academic mentor. Individually relevant documents that were shared with a broader audience were locked into permissions, which made them visible to the individual Google user and the research team. As with all materials for the REAL Program, a Google backup is run on an assigned College network server.

All surveys, tests and questionnaires were set to a completion date and then locked down to access only by the head of the research team to ensure validity of data. Relevant data sources that were shared for analysis by external consultants (including the California Critical Thinking Skills Test and the faculty project metrics analysis for SPSS) were copied and shared as Microsoft Excel files.

All original names were scrubbed from the original data sources to be coded in all tests and questionnaires. No names were recorded in any focus groups or interviews and there are no names attached to quotes by teachers, students or parents to ensure confidentiality. Measures to protect confidentiality were also taken with each individual lesson observation.

Only the individually observed teacher, the research team and academic mentor had access to the individual lesson observation scaffolds. This data was analysed twice, the first time of analysis was during the action research Phases 1, 2 and 3 and during this time teacher name and faculty was accessible to the research team. In the final phase of the research project, Phase 4 analysis and report writing was undertaken where all individual teacher names were scrubbed and coded while faculty names still remained for most data sets.

Student testing was always performed under exam conditions in central exam venues, and were centrally timed, counted and marked.

Data analysis:

Data analysis was undertaken throughout each phase of data collection to inform the action research interventions and assist with supporting the REAL program and embedding the pedagogy, methodology and processes. In particular, lesson observation, lesson timing data and focus group interviews were analysed to look for trends.

This study has tried to answer two linked parts of a question. The first part of the question sought to identify the ways that the primary features of the REAL program intervention, being a transparently declared online curriculum and a shift towards student-centred pedagogy, affect student outcomes. The second part of the question looked to measure a strengthened alignment in the declared, taught and learned curricula. The data sets collected over the term of the research project tracked the declared, taught and learned curriculums in the following ways:

Table 6 - Declared, Taught and Learned Curriculum

Area of Curriculum	Collected Data
Declared	● Quality Teaching Framework Assessment Analysis of pre-REAL programs and assessment task against those in the pilot and after (2013, 2014, 2015 Year 7) ● Lesson observations - Learning intentions linked to 'big ideas', success criteria, relevance, student choice, higher order thinking, metacognition ● Student, teacher, parent focus groups ● Google site analytics
Taught	● Lesson Observations - Learning intentions linked to 'big ideas', success criteria, relevance, student choice, higher order thinking, felicity to lesson aims, high expectations, feedback, lesson sequencing, evidence of collaboration ● Timing of lessons - teacher talk/student work/lost time, type of activity (independent, collaborative, instruction) ● Count of student off task behaviour in lessons ● Teacher self-efficacy survey ● Student engagement survey ● Student, teacher, parent focus groups
Learned	● Student engagement survey ● Student academic report analysis ● Allwell results ● California Critical Thinking Skills test ● Student, teacher, parent focus groups

To identify the ways student outcomes were affected by a transparently declared online curriculum and a shift towards student-centred pedagogy, the research team have connected the metrics of the declared and taught curriculum to student academic performance, critical thinking skills, attitudes to learning and engagement. To measure alignment of the declared, taught and learned curriculums, identified visible learning foci were tracked.

Table 7 - Curriculum Alignment

Declared Curriculum	Taught Curriculum	Learned Curriculum
● Learning intentions linked to 'big ideas' ● success criteria ● relevance ● student choice ● higher order thinking ● metacognition ● opportunities for formative assessment/feedback	● Learning intentions linked to 'big ideas' ● felicity to lesson aims ● success criteria ● relevance ● student choice ● higher order thinking ● metacognition ● feedback ● teacher talk/student work/lost time ● lesson sequencing - direct instruction, collaborative work, independent work	● behavioural, cognitive and emotional engagement ● critical thinking skills ● self-regulation ● academic performance from school assessment ● academic performance in standardised testing

As mentioned in the section on methodology, data has been analysed in both qualitative and quantitative ways. An example of a breakdown of this can be seen in the analysis of the 395 lesson observations over the three phases of data collection. Each sub-set of data was analysed in terms of the best fit for application of the data.

Table 8 - Lesson Observation Analysis

Observation	Evidence
Are the unit's objectives, 'big ideas', or 'understandings' made visible in the classroom? Does the teacher refer to them (posters, bulletin boards, etc... maybe they are electronic?	Qualitative & Quantitative
Is there a strong connection between aims and the lesson - symbiosis?	Qualitative & Quantitative
Does the teacher assess students learning, by either building on what the students know or look at ways in which the lesson is connected and relevant to the learner's personal experience?	Qualitative & Quantitative
Does the teacher make any explicit statements and communicate high expectations to all students about the quality expected of their work and the criteria how they will be assessed. (Explain what it means for the student to do well.)	Qualitative
Does the task encourage risk taking?	Qualitative & Quantitative A scale Likert scale used
Do students have an opportunity to exercise control over the choice of activities or time spent on activities? Are students on task? (10min phases, ot=off task, a= all on task)	Quantitative
Lesson sequence: Teacher: Instructional (In), Procedural (P), Regulatory (R) Independent work (I) Collaborative work (c) lost time (lt)	Quantitative
Does that feedback show the student 'where to next?	Qualitative & Quantitative

Is there any evidence of teacher collaboration during the lesson (combined classes, teacher discussion between teachers of the same subject area during the lesson?	Qualitative & Quantitative
The teacher demonstrated questioning strategies that were likely to enhance the development of student conceptual understanding. Question Styles and frequency.	Quantitative
Ask Student Sample during observation:	**Evidence**
What did success look like for you today?	Qualitative
What feedback did you get today?	Quantitative
Have you learnt about this topic in another subject?	Quantitative
Is there anything that you have learnt today that relates to your life outside of school?	Qualitative
Do you know what your next assessment task is?	Quantitative
What kind of thinking were you doing in this lesson?	Quantitative
What kind of thinking were you doing in this lesson?	Quantitative

Timing data, and focus group data was analysed in a similar way by the project research assistant who would tabulate the quantitative results and collect quotes and thematic positive and negative trends from the qualitative data. This information was shared with the head of the research project and academic mentor to assist with the ensuing professional development intervention with staff.

In Phase 4 of the project, all data was collated from the three earlier phases for deeper statistical analysis. The following table outlines the process for final analysis:

Table 9 - Final Analysis Process

Data Source	Final Analysis Process	Statistical Techniques Used	Appendices
Lesson observations	All data cleaned and coded into one spreadsheet for SPSS analysis to rank teachers and faculties in order of effectiveness in terms of project metrics. This data was also counted and scaled to create trend analysis graphs tracking metrics across the duration of the project, looking for growth in terms of each of the key pedagogical markers.	General polynomial trend curve analysis. Pearon's r Correlation Analysis Linear Regression ANOVA Analysis of Variance	Appendix (xix)
Teacher self-efficacy survey	All data cleaned and coded into one spreadsheet for SPSS analysis to rank faculties in order of effectiveness in terms of project metrics. This data was also counted to create trend analysis graphs tracking metrics across the duration of the project, looking for growth in terms of each of the key pedagogical markers.	Simple linear regression modelling. ANOVA Analysis of Variance	Appendix (xx)
Teacher interview	Raw interview transcripts formatted for use in Leximancer data visualisation software for trends. Trend analysis used to highlight themes and quotes.	Semantic analysis to discover themes and concepts as well as relational networks.	Appendix (xxi)
Student interviews	Raw interview transcripts formatted for use in Leximancer data visualisation software for trends. Trend analysis used to highlight themes and quotes.	Semantic analysis to discover themes and concepts as well as relational networks.	Appendix (xxi)
Parent interviews	Raw interview transcripts formatted for use in Leximancer data visualisation software for trends. Trend analysis used to highlight themes and quotes.	Semantic analysis to discover themes and concepts as well as relational networks.	Appendix (xxi)

QTF Assessment analysis	All data cleaned and coded into one spreadsheet for SPSS analysis to rank faculties in order of effectiveness in terms of project metrics. This data was also used to create trend analysis graphs tracking growth in each of the 3 domains.	Simple linear regression modelling. Using numerical averages to create a trend analysis of the quality of assessment growth over 18 months.	Appendix (xxii)
Lesson timing data	All data cleaned and coded into one spreadsheet for SPSS analysis to rank faculties in order of effectiveness in terms of project metrics. This data was also counted to create trend analysis graphs tracking averages across the 6 terms of the project.	Pearson's r Bivariate Correlation and linear regression. ANOVA Analysis of Variance Using numerical averages to create a trend analysis of the amount of teacher talk over 18 months and the average breakdown of timing in a REAL lesson.	Appendix (x)
Student academic report data	Student individual academic report data was analysed across Semester 1 and 2 of 2015 and Semester 1, 2016 for growth in total academic performance using the average of weighted subject marks as well as a comparison of performance in terms of attitudes to learning over the 6 terms of assessment.	Table analysis of growth	Appendix (xi)
California Critical Thinking Student Test	Pre-test and post test data analysed for growth using a statistical test of significance known as a T. Test to analyse for growth in abilities due to intervention.	Statistical Technique known as a "One-Tailed Student's T-Test", which tests the likelihood that two sets of data have different underlying	Appendix (xii)

		means. I ran this test in MS Excel using the following inputs: =TTEST(*baseline results*, *post-test results, one-tailed, paired)*	
Allwell testing	Pre-test and post-test data analysed for growth using a statistical test of significance known as a T. Test to analyse for growth in abilities due to intervention.	Growth analysis	Appendix (xiii)
Student engagement survey	Pre-test and post-test data analysed for trends in student perceptions and attitudes to learning, learning capabilities and metacognitive behaviours.	Growth analysis	Appendix (xiv)
Google site analytics	Tracking of REAL Program website from 1/2/2015 - 30/6/2016: - count of page views - Average page views per session - Average session time - count of sessions - count of users This data is used to support the validity of the lesson observation trends against possible bias in lesson observations and analysis.	Compare and contrast of interrelated data.	Appendix (xv)

The conceptual frameworks, or theories that informed the analysis approach of this study, link to the practical action research model. Central to the decisions around the types of analysis undertaken in this study, a systematic process of study and planning, taking action,

collecting and analysing evidence and reflection, has been undertaken. Evaluating snapshots of REAL classroom practice from the taught curriculum through lesson observations led to each intervention over the 18 months of the research project. While shortfalls in the taught curriculum were expected, they provided powerful points of intervention to demonstrate the variety of ways the publicly declared online curriculum was employed by teachers. This was confronting for staff, and despite the inclusive model of collaboration around the REAL Program and the project, a well of resistance was sprung. No matter how compelling the evidence to support intervention on an identified area for professional development to better support student learning outcomes, there was a faction of staff who discounted the analysis of trends.

The study has looked to identify effects of the REAL program on academic performance, critical thinking skills, attitudes to learning and engagement. The study has also tracked possible growth in these areas. It is quite possible that this is the result of closer alignment of the declared, taught and learned curricula.

The choice to demonstrate trend analysis using the general polynomial curve was made after looking closely at the largest data set, being the 395 lesson observations. While 395 lesson observations over 60 weeks is a considerable amount of data for a school based action research project, the spread of the observations across variables like faculties and teachers, demonstrated severe fluctuations which were difficult to address. When these fluctuations were 'flattened', for want of a better term, the trends were far easier to follow and indicated links to other known factors.

Early in the research process general trends were discovered but to add authority to these early trends, a deeper statistical analysis of the findings was determined essential for the final report. By drilling deeply into each data set and then looking for patterns across the collected data sets, there would be the necessary weight of evidence for change. Analysis of each data set provided vital information on various areas of the REAL Program. For example, on one level using the collection of questioning techniques used in REAL classrooms to target higher order thinking in the lesson observations was counted and averaged over the six terms of the study to track growth in this form of questioning. A more compelling understanding of the impact of the pedagogical push towards critical thinking in the learners at Oakhill was gained from looking at the Questioning Techniques data set along with the

Quality Teaching Framework Assessment analysis to identify faculties who more strongly employed the pedagogy of the REAL Program, which was reflected in these two pieces of evidence.

Results and Findings

Overview

Impacts on The Declared Curriculum

- Whilst this study cannot nominate causation with 100% certainty, from the findings it is reasonable to connect the targeted areas of the declared, taught and learned curriculum, with the effects of student outcomes.
- A transparently declared curriculum has had a significant impact on student outcomes in the eyes of students, parents and teachers.
- While initially threatened by the openness, individual teachers have increasingly observed the benefits of a transparently declared curriculum, terms of connections with stakeholders and improvements for student outcomes.
- During the focus interview process parents were happy with the opportunities to access the declared curriculum online. They were not only seeing the benefits for their individual child, but students saw the inherent improvements in efficiency for themselves.
- An appealing facet of the transparency was the ability to take control of learning from the perspective of parents and students.
- The most positive reaction in favour of the declared curriculum online came from both the student and parent focus groups.
- Once the decision to create the REAL Program was made, it became the driving impetus to create a more cohesive, engaging curriculum for students.
- The National Curriculum was shaping the changes to programs and assessments for many faculties whilst aligning current programs to UbD was a focus for other faculties.
- Minimising double-ups of content, sharing assessment and encouraging 'transfer' was another consideration for the declared curriculum.
- A push for more relevant skills and content that encourage higher-order and critical thinking was a consideration for all faculties.
- To track the impact of this focus on higher-order thinking the research team used the Quality Teaching Project Assessment Analysis Tool (Appendix ix) for all assessment tasks.

- Assessment tasks were coded from 2013 (pre-REAL Program) to the end of 2015 and there are three domains in the analysis; Intellectual Quality, Learning Environment and Significance.
- Over the three years of assessment measured, the quality of all three domains improved. The most significant improvement was in the intellectual quality domain.
- The improvement to the Intellectual Quality Domain across all faculties is significant and reflects the capacity for faculties to target higher-order thinking and process in their programming and assessment.
- Assessment, however, is an area, which still requires development.
- Assessment tasks that are worked on in class have formative elements, and clear criteria for success appeared the most eagerly supported by students and parents.
- All stakeholders acknowledged the growing importance of relevance in learning.
- Parents, students and staff were able to recognise the need for 21st century skills like collaboration and problem solving as essential for successful student outcomes.
- In focus groups across the study period, parents commented on the level of "risk taking/decision making" offered to their child.
- Students also identified that they enjoyed working on lessons where they had a sense of relevance and connection to the world.
- Teachers too, commented that, "Learning is like a roadmap for their future."
- Students and parents over the three phases of data collection have had an increasing understanding of the importance and role of technology as a tool for learning in and beyond the classroom.
- Students are keen to use technology when relevant, particularly to connect to people and experiences outside the classroom.
- Parents have become increasingly involved in using the digital platform, through both the website and the student workspaces.
- There have been several identifiable factors contributing to better student outcomes which include: better IT training for students, opportunities for parents to learn about the school's technology platforms and tools, a growing confidence in staff to use technology and significant focus on improving the technology infrastructure and staffing at the College.

- The targeted preparation of parents and students in using technology was captured during the Phase 3 focus groups with both groups responding positively.
- Initially teachers raised concerns about being substituted by computers and losing control of the classroom, however, there were fewer instances of these issues raised as concerns in Phase 3 of the data collection.
- There has been significant development in parent engagement over the three phases of the research project as indicated in the parent focus groups and IT workshops.
- The Year 7 Transition program used feedback from the Phase 1 and Phase 2 focus groups and appears to have been well received by parents, with particular mention made of the value of the Portal as a tool to track a student's progress.

Impacts on The Taught Curriculum

- Perhaps the most obvious impact of transparency, in particular on student outcomes, is the ability to track student engagement.
- During the lesson observations, a series of measures were taken with the aim of identifying behavioural and cognitive engagement.
- From the data collected in observations, the number of off task students is the smallest at the start of the lesson (mean = .78), and largest at 50 minutes into the lesson (mean = 3.09).
- At 40 minutes into the lesson, Collaborative tasks appear to associate with the smallest number of off task behaviours, whereas Instruction appears to cause the most.
- At 50 minutes into the lesson, Regulatory tasks appear to associate with the smallest number of off task behaviours, whereas Instruction appears to cause the most.
- As a general trend the numbers of students demonstrating off task behaviour including low cognitive engagement in the work are few. An average of 1.85 students, approximated to 2 students are disengaged at any point of a lesson.
- To strengthen the measure of cognitive engagement, a sample of three students was questioned at the end of each lesson as to what they had learned. 56% of students interviewed in lesson observations were able to clearly articulate learning in their

own words, while 60% of student correctly identified the type/s of learning they had experienced during the lesson.

- Student emotional engagement was tracked through attitudes to learning in the pre and post student engagement and resilience survey. Over the period of the study the emotional engagement in school and learning demonstrated a small regression. Taking into account the small numbers in the decline and the possible contributing factors, the regression in student emotional engagement in school and learning is not considered significant.
- From the focus group interviews across all the phases of data collection, students identified that they really learn when they are thinking, working hands-on or practically, when they are organised, when they work in groups or independently, and when the work is relevant.
- Over all three phases of data collection, students identified that they learned most effectively when they had ownership of their learning, when they were involved in active types of learning opportunities, and when the lesson was relevant.
- Students were able to identify the need for lifelong learning and skills that are relevant to the workplace of the future, collaboration, communication, creativity and their own responsibility as a learner.
- Students nominated in all three phases of data collection that they wanted more time on tasks, they wanted to know where they are going, how to be successful and prefer deep learning experiences.
- 56% of students interviewed in lesson observations were able to clearly articulate learning in their own words, while 60% of student correctly identified the type/s of learning they had experienced during the lesson.
- Students say learning looks like them thinking, using their voice and engages both them and their teachers.
- The taught curriculum was measured by observation of lessons, over twelve domains. Analysis shows that the top three domains that are most demonstrated (in this order) across 12 faculties are:
    1. Practice demonstrates felicity to lesson aims, and is connected to declared curriculum
    2. Link to assessment visible to students.

3. Practice visibly demonstrates connection to 'Big Ideas'

- Three domains that are least demonstrated (in this order) across faculties are:
    1. Evidence of feedback. 0=None
    2. Evidence of teacher collaboration
    3. Evidence of transfer or cross-curricular.
- An area of some concern in a school the size of Oakhill is inter-class variance, which has been one of the drivers behind the online declaration of the REAL Program. This has proved to be a confronting change to practice for many classroom teachers who were used to the high degree of professional autonomy of teaching.
- There is a trend for more extensive and meaningful feedback from practical based exercises, thus faculties with high levels of practical, hands-on tasks offer more extensive feedback more regularly. The high overall ranking of Science, Music and PDHPE would reflect this finding.
- Of all the measurements, evidence of teacher collaboration during lesson observations was the most lacking. While a faculty like PDHPE built a strong collaborative practice of joint lessons to maximise feedback opportunities for students and to harness the differing areas of syllabus expertise, most other faculties demonstrated little collaborative practice.
- To counter the impact of a lack of time for collaboration, the College reduced the teaching load of 39.4 to 36 periods per fortnight cycle in 2016 to create three periods (a little over three hours) as professional learning allocation.
- While there has been evidence of improved opportunities for collaborative professional learning during this newly created time, there was no evidence to suggest an improvement in collaborative classroom practice.
- There has been no rise in collaborative practice after the introduction of instructional rounds following Intervention 6.
- Evidence of transfer or cross-curricular connection was also low in terms of observed practice in lessons and is on a downward trajectory in the trend lines from lesson observations.
- There is a strong correlation between those teachers who set high expectations in the classroom and provision of extensive feedback.

- The impact of transparency and the shift towards student-centred pedagogy includes the questioning techniques applied in classrooms and their occurrence. There were some statistically significant findings across the faculties, in particular, in the higher-order questioning category.
- Factual questions were asked most in comparison to other types of questions with structural questions being asked least in comparison with other questions.
- Feedback is acknowledged by all stakeholders as extremely important, appearing throughout each phase of data collection. Parents, staff and students have identified the importance of feedback.
- The desire for more specific, timely and directive feedback from students is in direct correlation with their hope for deeper learning, more hands on and active experiences with a personalised engagement with the work and their teacher.
- There appears to be a gap in understanding amongst all stakeholders regarding what constitutes feedback and how it should be given.
- The misconceptions about praise as feedback permeate the findings in all focus groups.
- It appears that the failure to recognise the importance of directing students 'where to next' is linked to broader issues about teacher identity and deep-seated gaps in pedagogical understanding.
- Aligned with a reticence to see the value of student access to a success criterion, student choice as a whole is an area that has not improved at a positive rate.
- Student choice is associated with the opportunity to work at their own pace, their option to choose a mode of presentation of learning, opportunities to choose content or area of interest in classwork or to work in a group of their own choice.
- During the lesson observations, student choice was measured and identified as one of the least demonstrated of the 12 domains with student choice only evident in 52.98% of lesson observations and was most frequently applied by the Geography faculty.
- In the Phase 2 teacher survey, a survey of all teachers of the 2015 Year 7 cohort, 82.8% of the teaching staff who were applying the declared curriculum identified that they rarely or sometimes offered opportunities for student choice. Only 3.1% of staff nominated that it was a regular part of their practice.

- Students are adamant, with some of the most standout responses in the focus group interviews, that they do not want teacher talk, they want relevant work that they do themselves.
- The focus groups consistently revealed that students find that some teachers talk far too much in lessons.
- Data indicates there is a statically significant difference between the 12 faculties in terms of the Total Teacher Talk Time.
- Students identified that they cannot learn when their wellbeing is compromised and when there is not an atmosphere of control in the classroom.
- Lesson observations revealed that on average little time was spent on regulatory talk, which would indicate little off task behaviour.
- Focus groups revealed homework as an increasing area of concern for students, parents and staff. Rather, students are keen to work on assessments.
- Parents also identified homework lacking relevance or connection to assessment or classwork.
- Students and staff also indicate that homework is more of an issue in the transition year of high school, differing significantly from approaches in primary school.
- Teachers identified in the survey at the end of Phase 2 indicated that there is very little discussion across the faculties in terms of homework.
- The staff focus groups reflected some movement in a high number of the teaching staff in the College towards more contemporary, considered and reflective practice that is focused on the individual student through a student-centred approach.
- The broadening gap between those who are 'on board' with REAL and those who do not understand the pedagogy is highlighted in responses in the final phase of the data collection.
- In Phase 1, there were firmly those teachers that were willing to learn and there were also those who were skeptical.
- Across the three phases of data collection, the trend has surfaced where those who take the opportunity to learn about the pedagogy and reflect on their own practice are seeing the benefits to student outcomes.
- Those with strong resistance to changes that impact on teacher identity and require them to work to update their practice, resources and tools, continue to resist.

- There are also those who are non-compliant and reject any evidence of improved student outcomes.
- Self-efficacy is a prominent undercurrent in the support or resistance of the REAL program amongst staff.
- Those teachers who believe that their role as a teacher aligns with a transparent, collaborative and relevant practice that is student-centred, have flourished under the pedagogy.
- Those teachers who are of the firm belief that the program impinges on their identity as a teacher struggle with one or more elements of the program.
- There is also a subgroup of teachers that are simply resistant to any change.
- Throughout the three phases of data collection, the balance of teaching and learning has been altered due to the shift towards a more student-centred pedagogy.
- When a teacher demonstrated significant gaps in pedagogical understanding of the REAL program, student outcomes were affected. These effects could include less time for student work due to more teacher talk time, fewer high order questions on offer in lessons and weaker connections to the 'big ideas' of the declared curriculum.
- Linked to concepts of management and transition in particular, there is an undeniable influence of time on the ability of transparency and a shift to more student-centred pedagogy and effects on student outcomes.
- The influence of time has been mentioned in focus group discussions, staff survey responses and appears consistently in each of the researcher's notes.
- Parents identified that they want more time to learn about the ways students work and how to use the IT platforms of the REAL Program.
- Students identified that they wanted more time to spend on concepts when they learn them, options for deeper learning in particular.
- Teachers were adamant that more time to plan and develop and improve their own skills and understanding would be of benefit.

Findings On the Learned Curriculum

- A measure of the impact of a transparently declared curriculum and a shift towards student-centred pedagogy on critical thinking indicates that Oakhill's results

demonstrated a significant improvement in student performance, with overall Post-Test scores increasing by 14% compared to Baseline testing.

- Analysis of a Statistical "Test of Significance" (known as a T.Test with 99.99% probability) has confirmed that there is *enough evidence* that students' abilities have genuinely grown.
- There was statistically significant growth in both overall mean and median results, and statistically significant growth in all of the six skills. This is likely a reflection of the significant experiences that students have undergone between May 2015 and July 2016.
- A Statistical T.Test enables us to conclude scientifically that there has been a change in the "underlying average" of students' abilities, as opposed to the differences being good fortune.
- All results far exceeded the 95% threshold generally used in Statistics to conclude that there is sufficient evidence of growth.
- Given the extent of experiences students will have undergone between Term 2 in Year 7 and Term 3 in Year 8, it is not surprising that there has been a degree of "changing of the guard".
- The final data set of findings to highlight student outcomes comes from the series of Allwell tests run in 2015 and September 2016.
- All figures demonstrate growth except for *Figure 31*, which demonstrates a drop in numeracy levels.
- There can be a reasonable connection between the impact of transparency and a shift towards student-centred pedagogy and these results.
- Looking at the findings in relation to faculty overall rankings in the domains measured during lesson observations, subjects with a strong reading and writing base rank highly, in particular, English and Geography, whilst Mathematics is ranked second lowest.
- Mathematics also ranks in the bottom three faculties across all three measured domains in the Quality Teaching Framework analysis of assessment tasks covered earlier in the findings.
- On all measures of the declared and taught curriculum, the Mathematics department demonstrates as not being supportive of the transparent declared

online curriculum and not supportive of a move towards more student-centred pedagogy.

- The pattern of growth in general reasoning is similar in both the Allwell tests and in the findings of the analysis of the California Critical Thinking Skills Test.
- The movement of students from the bottom three stanines into the top three stanines reflects the emphasis of deep thought and problem solving from the changes made to the declared and taught curriculums.
- The most successful faculty in terms of holding a connection to their declared curriculum was English with a rate of 96.5% across 57 samples.
- This is an important statistic, as the English faculty is large, and in the senior years of schooling can have as many as 12 different classes in the one course.
- Consistency is a concern for students, parents and staff and appears linked to the transparent nature of the REAL program as people now have the ability to identify inconsistencies in the visible learning environment and support their concerns through the transparency of the program.
- Parents can very clearly see deviations from the declared curriculum and inconsistencies in this area and raise concerns about this.
- Staff, in focus groups, reported that they were not surprised by inconsistencies within departments.
- The public nature of the website has supported a level of compliance for faculties as they are held to account by students, staff and parents when documentation is not compliant.
- This level of compliance is one measure of alignment, as now all assessment tasks are standardised using the Quality Teaching Project domains and are declared, clearly linking to the learning sequence.

Results and Findings

Like much educational research, this study cannot nominate causation with 100% certainty when providing the findings of the links between a transparently declared curriculum coupled with a shift to more student centred pedagogy and student learning outcomes. It is, however, reasonable to connect the targeted areas of the declared, taught and learned curriculum, which includes the pedagogical shift, with the effects on student outcomes. The findings in this section of the report reflect what could be 'seen'.

In what ways is student learning affected by curriculum transparency and a shift towards student-centred pedagogy?

The report findings in terms of the effects of curriculum transparency and a shift towards student-centred pedagogy on student learning will be covered under the areas of; the declared curriculum, taught curriculum and learned curriculum.

Impacts on The Declared Curriculum

A transparently declared curriculum has had a significant impact on student outcomes in the eyes of students, parents and teachers. All stakeholders have accepted this impact over the course of the research. While initially threatened by the openness, individual teachers have increasingly observed the benefits of a transparently declared curriculum and what it offers in terms of connections with stakeholders and improvements for student outcomes. During the focus interview process parents were happy with the opportunities to access the declared curriculum online, "I have the impression my son has ownership and control through the REAL Program. He definitely knows where he is going." Parents were not only seeing the benefits for their individual child, but students saw the inherent improvements in efficiency for themselves, "If I'm away or I fall behind I can see what I have to do."

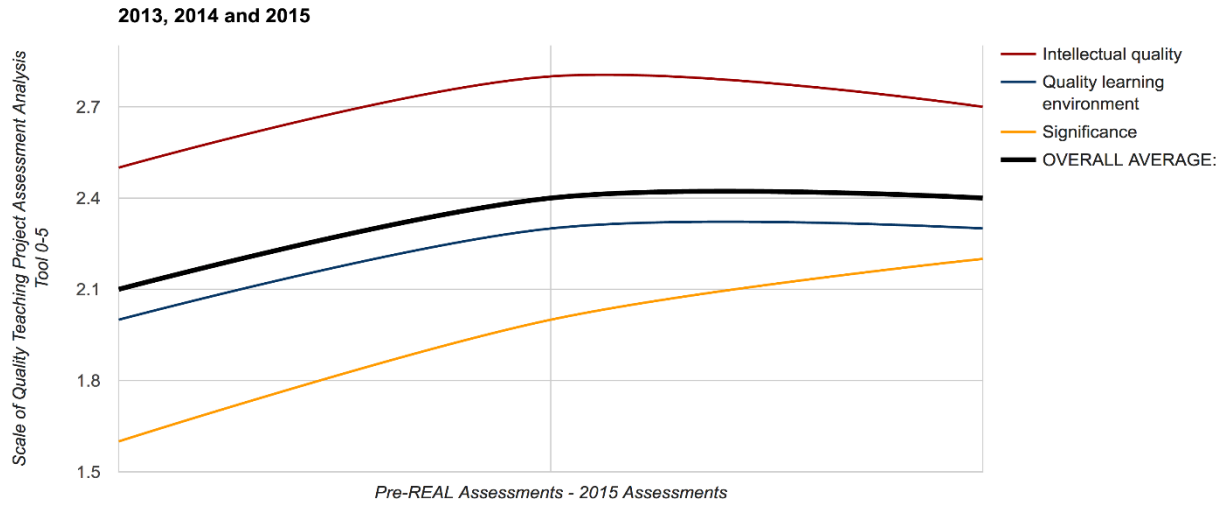
An appealing facet of the transparency was the ability to take control of learning from the perspective of parents and students, many parents indicating it was, "Very empowering for parents." Teachers also acknowledged, "Students like to have the direction and know what they are doing through the website." The most positive reaction in favour of the declared

curriculum online came from the student focus groups, “I love the REAL Program. I know where I am going, kids know where they are going and parents know where they are going.”

Once the decision to create the REAL Program was made, it became the driving impetus to create a more cohesive, engaging curriculum for students. The National Curriculum was shaping the changes to programs and assessments for many faculties. Aligning current programs to UbD was a focus for other faculties who may not have had the syllabus pressure but had failed to embrace the backward design model of the Oakhill learning framework. Minimising double-ups of content, or at least timing them to better support students by sharing assessment and encouraging ‘transfer’ was another consideration for the declared curriculum. Finally, the push for more relevant skills and content that encourage higher-order and critical thinking was a consideration for all faculties.

To track the impact of this focus on higher-order thinking the research team used the Quality Teaching Project Assessment Analysis Tool (Appendix ix) for all assessment tasks. Assessment tasks were coded from 2013 (pre-REAL Program) to the end of 2015. There are three domains in the analysis; Intellectual Quality, Learning Environment and Significance. Over the three years of assessment measured, the quality of all three domains improved. The most significant improvement was in the intellectual quality domain.

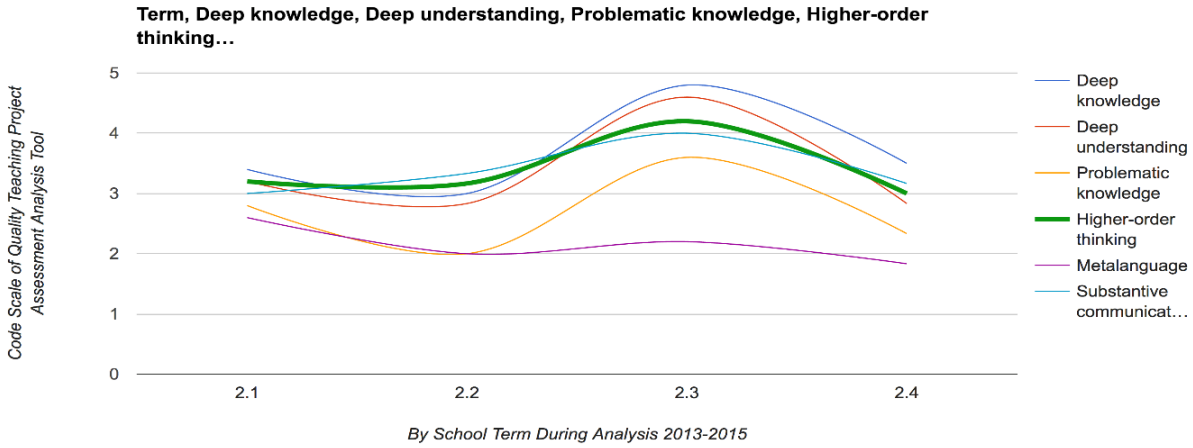
Figure 4: Assessment Analysis



The improvement to the Intellectual Quality Domain across all faculties is significant and has reflected that the capacity for faculties to target higher-order thinking and process in their programming and assessment. Changes to the quality of Learning Environment through assessment, as well as Significance, appear to be well received by parents and students.

However, assessment is still an area for development when it comes to consistency, which would be supported by the lack of quality marking criteria improvements across the faculties. Assessment tasks that are worked on in class, have formative elements, and a clear criteria for success appeared the most eagerly supported by students and parents, "...everything we did in class was part of the assignment".

Figure 5: Assessment Analysis

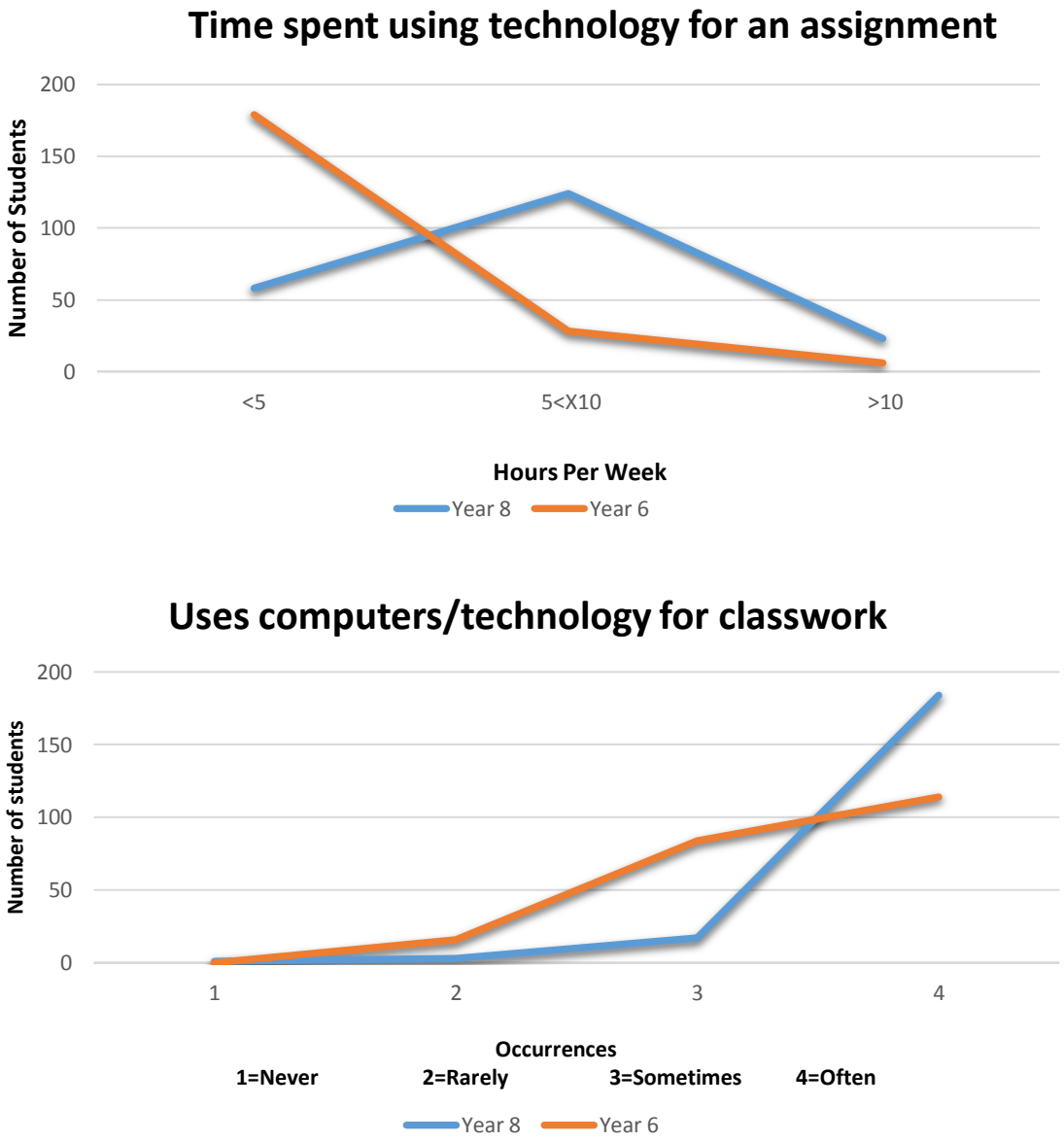


All stakeholders acknowledged the growing importance of relevance in learning. In the focus groups, parents and students talked about the Geography program as a strong example of relevant learning connected to a real-world problem. This program studies the impact of the Football World Cup on living standards. There were variations to this program outside the data collection period, which have since linked the program to the impact of the 2016 Olympics in Rio. Students identified that relevance was most strongly emphasised through areas of interest and future careers. Parents, students and staff were able to recognise the need for 21st century skills like collaboration and problem solving as essential for successful student outcomes. In focus groups across the study period, parents commented on the level of "risk taking/decision making" offered to their child. Students also identified that they enjoyed working on lessons where they had a sense of relevance, it is "good to be creative, take kids out into the real world." Teachers too, commented that, "Learning is like a roadmap for their future."

Students and parents over the three phases of data collection have had an increasing understanding of the importance and role of technology as a tool for learning in and beyond the classroom. Students are keen to use technology when relevant, particularly to connect to people and experiences outside the classroom. Evidence of this can be seen in *Figure 6*

which is a comparison of the study cohort's pre-test and post-test engagement and resilience survey. During the 18 months of the study, students in the project cohort identified that their contributions via online questions or discussions had grown significantly.

Figure 6: Pre-test and Post-test Comparison



Parents have become increasingly involved in using the digital platform, through both the website and the student workspaces. The gradual nature of improvement in technology supporting better outcomes for student learning has had several contributing factors including, better IT training for students, opportunities for parents to learn about the school's technology platforms and tools, a growing confidence in staff to use technology and significant focus on improving the technology infrastructure and staffing at the College. The

difference in the preparation of parents and students in using technology was captured during the Phase 3 focus groups; “The support that the boys got with technology this year was fantastic.” There is still a gap in teacher ICT skills and confidence to use technology appropriately, particularly in the augmentation or redefinition of learning tasks rather than as a substitution of digital for traditional handwriting. Issues linked to teacher identity have a significant impact on a teacher’s willingness to use ICT in the classroom, “I like the eye-contact. I have a harder time picking up who is with me and who isn’t using technology” and “There is too much work on the computer, it is too hard for students to review their work online.”

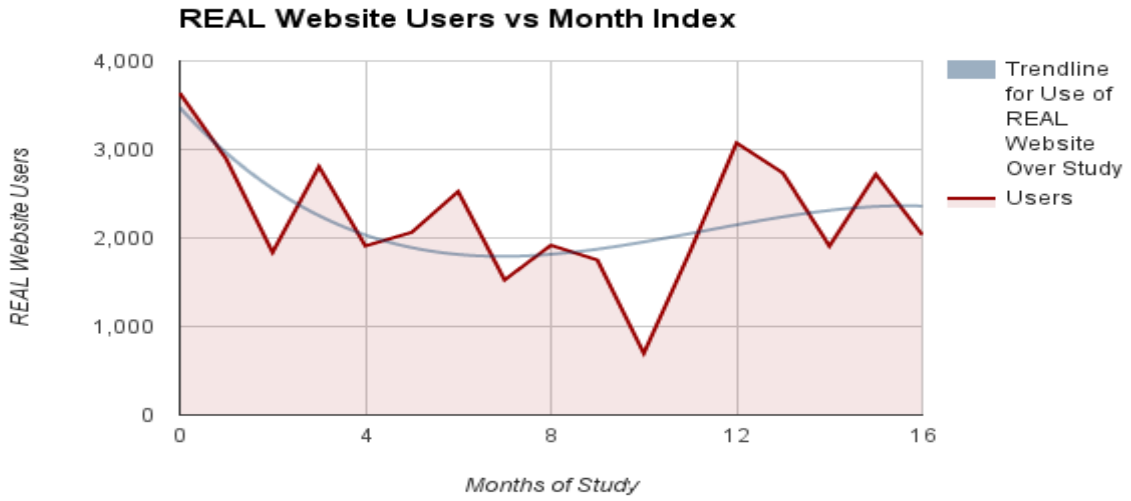
Teachers raised concerns about being substituted by computers and losing control of the classroom, “Technology inhibits my freedom as a teacher”, “Technology is a dis-service to lower-ability kids” and “How do I monitor the engagement in my subject?” However, there were fewer instances of these issues raised as concerns in Phase 3 of the data collection.

There has been significant development in parent engagement over the three phases of the research project as indicated in the parent focus groups and IT workshops. The parent focus group discussions also indicated a growing expectation from parents of a more personalised approach to their son’s classroom experience. Many of Oakhill’s students come from diocesan primary school that have open learning environments, with a heavy technology focus and thus parents are increasingly expecting an ICT rich environment with visible learning and engagement opportunities for parents. Improvements and opportunities created by the REAL program and the research project have afforded a more open dialogue with parents about the pedagogy behind REAL through the parent focus groups and IT workshops. The Year 7 Transition program used feedback from the Phase 1 and Phase 2 focus groups and appears to have been well received by parents as evidenced by quotes such as “The school has delivered on many fronts, pastorally, academically and socially through the Transition program.” It is a move in the right direction in terms of engaging parents in learning, the “Portal is excellent to allow access into a child’s progress. I can follow the lesson and my son’s learning.”

To track engagement with the declared online curriculum by all stakeholders, the research team was able to use Google Analytics to count users, sessions and page views over the time of data collection. During this time there were 1,137,885 page views, 23,042 users and

311,200 discreet sessions. An interesting finding from *Figure 7* is that the trend line for REAL website use over the 18 months of data collection mirrors the trend lines of the 12 measured domains from the lesson observations. This pattern is important to the study as it adds validity to the lesson observation data as a completely automated data set. It also serves to support the hypothesis that the declaration of the curriculum in the online environment is pivotal to engagement with a series of visibility measures.

Figure 7: REAL Website Usage



Impacts on The Taught Curriculum

Perhaps the most obvious impact of transparency, in particular on student outcomes, is the ability to track student engagement. During the lesson observations, a series of measures were taken with the aim of identifying behavioural and cognitive engagement. Throughout the lesson observations, a series of timing markers were noted and a count of students demonstrating off task behaviours was taken by the lesson observer. While off task behaviour is more likely a measure of behavioural engagement, with the additional access to every student in the study cohort's Google Drive, the lesson observer was able to reasonably identify cognitive engagement through the amount of work completed and the visibility of each student in their documents.

Table 10 - Descriptives of the number of off task behaviours/students at different points in time into the lesson across 12 faculties

	N	Range	Minimum	Maximum	Mean	Std. Deviation
Start of lesson.	344	25	0	25	.78	2.354
10 minutes into lesson.	342	14	0	14	1.65	2.306
20 minutes into lesson.	341	12	0	12	2.11	2.160
30 minutes into lesson.	342	24	0	24	2.45	2.577
40 minutes into lesson.	322	13	0	13	2.84	2.599
50 minutes into lesson.	172	12	0	12	3.09	2.607
Valid N (listwise)	169					

Based on this descriptives table, it can be seen that the number of off task students is the smallest at the start of the lesson (mean = .78), and largest at 50 minutes into the lesson (mean = 3.09).

In the collection of data in lesson observations and the analysis, off task behaviour has been aligned to the type of learning task used. The type of learning that was used was measured over key 10 minute periods as represented in the series of tables to follow

Table 11 - Type of task at 30 minutes into lesson.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	**Instructional**	95	26.0	26.2	26.2
	Individual	148	40.5	40.9	67.1
	Collaborative	115	31.5	31.8	98.9
	Regulatory	4	1.1	1.1	100.0
	Total	362	99.2	100.0	
Missing	99	3	.8		
Total		365	100.0		

From the table above, the distribution of types of tasks 30 minutes into the lesson are:

- 26.2% = instructional
- 40.9% = individual
- 31.8% = collaborative
- 1.1% = regulatory

Table 12 - Type of task at 40 minutes into lesson.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	**Instructional**	76	20.8	21.5	21.5
	Individual	160	43.8	45.2	66.7
	Collaborative	114	31.2	32.2	98.9
	Regulatory	4	1.1	1.1	100.0
	Total	354	97.0	100.0	
Missing	99	11	3.0		
Total		365	100.0		

Table 13 - Type of task at 50 minutes into lesson.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	**Instructional**	45	12.3	22.2	22.2
	Individual	90	24.7	44.3	66.5
	Collaborative	66	18.1	32.5	99.0
	Regulatory	2	.5	1.0	100.0
	Total	203	55.6	100.0	
Missing	99	162	44.4		
Total		365	100.0		

One-way analysis of variance (ANOVA) between the Types of Tasks and the number of off task behaviours at 30 minutes into lesson Anova is carried out to see if there is a statistically significant difference in the number of off task behaviours between the different types of tasks at 30 minutes into the lessons.

Table 14 - Types of Tasks and the Number of Off Task Behaviours Descriptives: *30 minutes into lesson*

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Instructional	86	2.63	2.639	.285	2.06	3.19	0	9
Individual	137	2.16	2.126	.182	1.80	2.52	0	10
Collaborative	112	2.71	3.003	.284	2.15	3.28	0	24
Regulatory	4	3.00	2.582	1.291	-1.11	7.11	0	6
Total	339	2.47	2.580	.140	2.20	2.75	0	24

Table 15 - Ranking of the types of tasks and the average number of off task behaviours

Type of task	Mean (average number of off task behaviours)	Ranking
Individual	2.16	1
Instructional	2.63	2
Collaborative	2.71	3
Regulatory	3	4

This means at 30 minutes into the lesson, individual tasks appear to associate with the smallest number of off task behaviours, whereas Regulatory appears to cause the most.

Table 16 - ANOVA: 30 minutes into lesson

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	23.066	3	7.689	1.156	.326
Within Groups	2227.417	335	6.649		
Total	2250.484	338			

Result of ANOVA, however, indicates that there is no statistically significant difference in the number of off task behaviours across 4 types of tasks at 30 minutes into lesson $F(3, 335) = 1.156$, $p = .326 > 0.05$

One-way analysis of variance (ANOVA) between the types of tasks at 40 minutes into lesson the number of off task behaviours.

Table 17 - Types of Tasks and the Number of Off Task Behaviours Descriptives: *40 minutes into lesson*

					95% Confidence Interval for Mean			
	N	Mean	Std. Deviation	Std. Error	Lower Bound	Upper Bound	Minimum	Maximum
Instructional	71	3.35	2.824	.335	2.68	4.02	0	13
Individual	139	2.83	2.553	.217	2.41	3.26	0	11
Collaborative	106	2.56	2.504	.243	2.07	3.04	0	12
Regulatory	4	3.00	2.160	1.080	-.44	6.44	0	5
Total	320	2.86	2.600	.145	2.57	3.15	0	13

Table 18 - Ranking of the Types of Tasks and the Average Number of Off Task Behaviour

Type of task	Mean (average number of off task behaviours)	Ranking
Collaborative	2.56	1
Individual	2.83	2
Regulatory	3	3
Instruction	3.35	4

This means at 40 minutes into the lesson, Collaborative tasks appear to associate with the smallest number of off task behaviours, whereas Instruction appears to cause the most.

Table 19 - ANOVA: 40 minutes into lesson

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	27.120	3	9.040	1.341	.261
Within Groups	2129.552	316	6.739		
Total	2156.672	319			

Result of ANOVA however indicates that there is no statistically significant difference in the number of off tasks behaviours across 4 types of tasks at 40 minutes into lesson $F (3, 316) = 1.341$, $p = .261 > 0.05$.

One-way analysis of variance (ANOVA) between the types of tasks at 50 minutes into lesson the number of off task behaviours.

Table 20 - Types of Tasks and the Number of Off Task Behaviours Descriptive: *50 minutes into lesson*

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Instructional	40	3.30	2.345	.371	2.55	4.05	0	10
Individual	68	3.10	2.765	.335	2.43	3.77	0	12
Collaborative	51	3.08	2.792	.391	2.29	3.86	0	9
Regulatory	2	2.50	.707	.500	-3.85	8.85	2	3
Total	161	3.14	2.645	.208	2.73	3.55	0	12

Table 21 - Ranking of the Types of Tasks and the Average Number of Off Task Behaviours

Type of task	Mean (average number of off task behaviours)	Ranking
Regulatory	2.5	1
Collaborative	3.08	2
Individual	3.1	3
Instruction	3.3	4

This means at 50 minutes into the lesson, Regulatory tasks appear to associate with the smallest number of off task behaviours, whereas Instruction appears to cause the most.

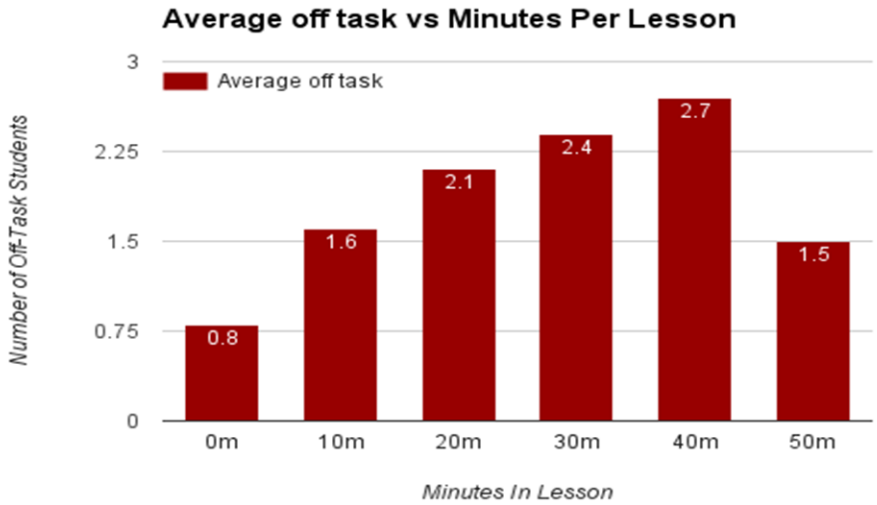
Table 22 - ANOVA: 50 minutes into lesson

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	2.128	3	.709	.100	.960
Within Groups	1116.866	157	7.114		
Total	1118.994	160			

Result of ANOVA however indicates that there is no statistically significant difference in the number of off tasks behaviours across 4 types of tasks at 40 minutes into lesson F (3, 157) = .100, p = .960 > 0.05

As a general trend the numbers of students demonstrating off task behaviour including low cognitive engagement in the work are few. An average of 1.85 students, approximated to 2 students are disengaged at any point of a lesson. These measures of off task students do not indicate disruptive behaviours and when the off task data set is compared with the amount of regulatory talk in the observed lessons, which would average at 90 seconds a lesson, it could be reasonably stated that there is little disruptive behaviour in observed lessons.

Figure 8: Off Task Tally

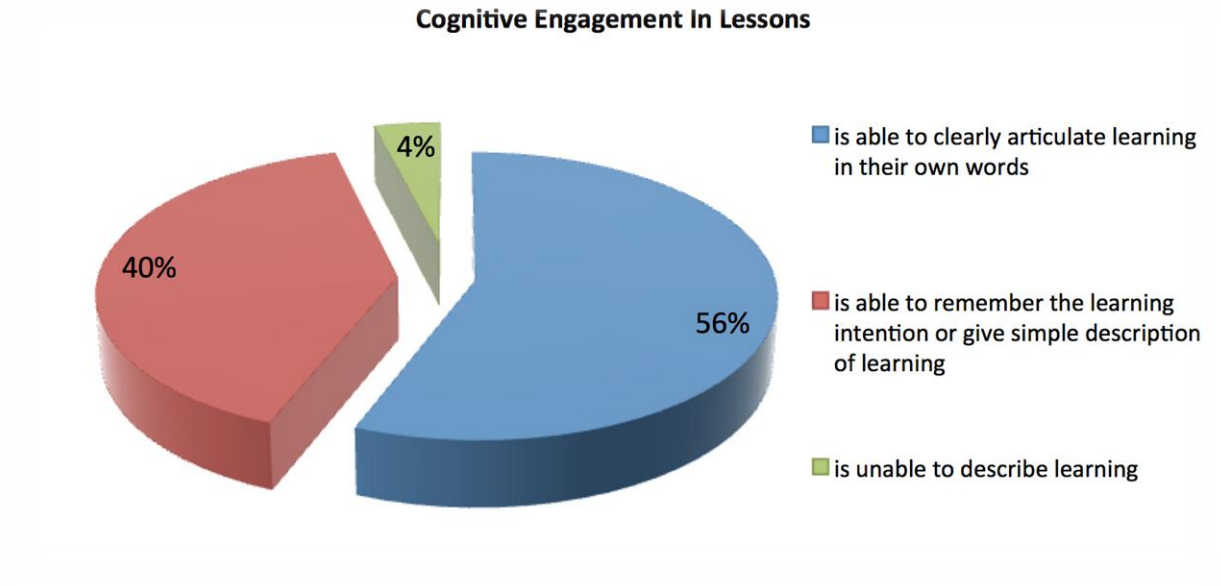


To strengthen the measure of cognitive engagement, a sample three students were questioned at the end of each lesson as to what they had learned. Students were also asked to identify the type/s of learning they were involved in during the lesson. The identification of learning task was offered to students in two ways, which involved either nominating the words themselves or selecting from a laminated prompt sheet of Bloom's Taxonomy. The ability to describe what a student had learned was coded as:

- is unable to describe learning
- is able to remember the learning intention or give simple description of learning
- is able to clearly articulate learning in their own words

56% of students interviewed in lesson observations were able to clearly articulate learning in their own words, while 60% of student correctly identified the type/s of learning they had experienced during the lesson.

Figure 9: Lesson Engagement



Student emotional engagement was tracked through attitudes to learning in the pre and post student engagement and resilience survey. Over the period of the study the emotional engagement in school and learning demonstrated a small regression.

Figure 10: Emotional Engagement

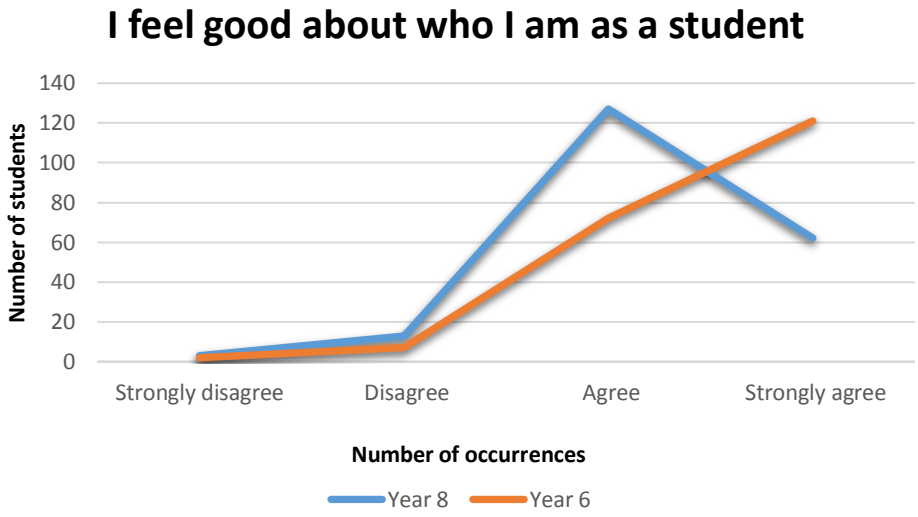
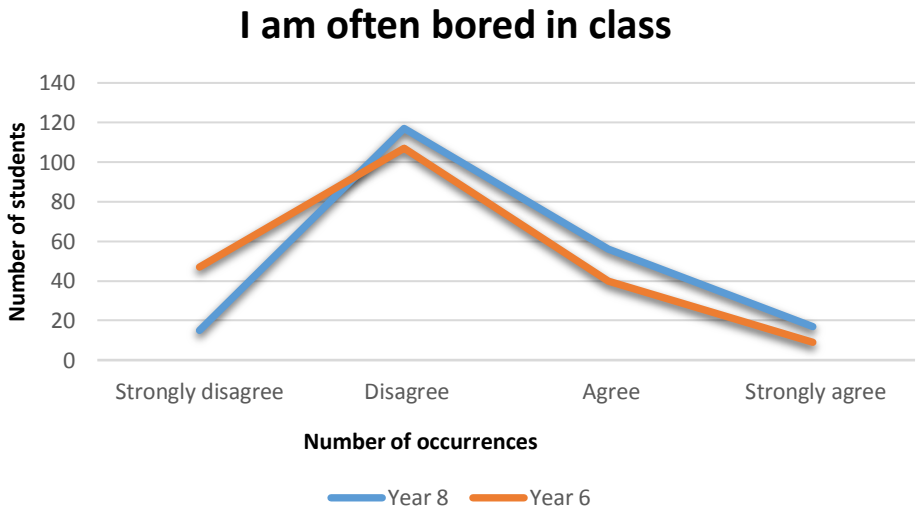


Figure 11: Learning engagement



Taking into account the small numbers in the decline and the possible contributing factors, the regression in student emotional engagement in school and learning is not considered significant.

It is reasonable to accept that when the original pre-test measures were taken, the cohort candidates were Year 6 students in primary school and as the most senior students in their schools, had a generally positive experience of school life in comparison to the post test period of survey. The post-test was taken at the end of Semester 1 in Year 8, which is a significant period for the cohort group who were no longer the senior students in their school.

From the focus group interviews across all the phases of data collection, students identified that they really learn when they are thinking, working hands-on or practically, when they are organised, when they work in groups or independently and when the work is relevant. A quote from a student that sums up this feeling is, “Actually doing what you’re learning”. Students say learning looks like them thinking, using their voice and engages both them and their teachers. Students said they knew when they were learning because “you can talk about your work and how you are going”.

Over all three phases of data collection, students identified that they learned most effectively when they had ownership of their learning, when they were involved in active types of learning opportunities, and when the lesson was relevant. Students were able to identify the need for lifelong learning and skills that are relevant to the workplace of the future, collaboration, communication, creativity and their own responsibility as a learner. As one student articulated, “thinking outside the box, being able to solve one problem in many ways.” Students nominated in all three phases of data collection that they wanted more time on tasks, they wanted to know where they are going, how to be successful and prefer deep learning experiences. A strong indication of this desire for student-centred work is, “I want to figure things out more on my own, less teacher explanation” and students “want to know what (you) are aiming for and what the goal is.”

The taught curriculum was measured by observation of lessons, over twelve domains. The twelve domains are evident in Table 27. Through various statistical analyses the research team have identified findings for ten individual domains but have grouped the findings on feedback in one discussion.

Table 23 - The 12 Domains of REAL Observed in Lessons Descriptive Statistics

	N	Range	Minimum	Maximum	Mean	Std. Deviation	Variance
Practice visibly demonstrates connection to 'Big Ideas'	12	56.2	40.0	96.2	66.648	20.2394	409.634
Demonstrates felicity to lesson aims, is connected to declared curriculum	12	22.8	73.7	96.5	87.733	6.7559	45.642
Pedagogy is relevantly connection to prior, learnt curriculum	12	63.5	25.0	88.5	58.796	17.6339	310.953
Success criteria is visible	12	49.8	23.1	72.9	47.475	18.0721	326.602
Outcomes are held to high expectations	12	52.2	18.4	70.6	42.356	17.8292	317.881
Student choice evident.	12	44.7	26.7	71.4	48.350	14.0022	196.061
Evidence of feedback. 0=None	12	7.7	.0	7.7	3.542	2.6589	7.070
Evidence of feedback. 1=Some	12	37.0	20.0	57.0	39.382	12.2256	149.465
Evidence of feedback. 2=Extensive	12	36.5	38.5	75.0	57.136	12.6013	158.794
Evidence of teacher collaboration	12	61.5	.0	61.5	19.381	15.5327	241.263
Evidence of transfer or cross-curricular	12	38.6	8.7	47.3	35.604	11.3411	128.621
Link to assessment visible to students.	12	72.0	19.0	90.9	69.679	19.1541	366.881

Based on this analysis, it shows that the top three domains that are most demonstrated (in this order) across 12 faculties are:

1. Practice demonstrates felicity to lesson aims, and is connected to declared curriculum
2. Link to assessment visible to students.
3. Practice visibly demonstrates connection to 'Big Ideas'

Three domains that are least demonstrated (in this order) across faculties are:

Evidence of feedback. 0=None /2. Evidence of teacher collaboration / 3. Evidence of transfer or cross-curricular. Evidence of the practice that visibly connects to the ‘big ideas’

was a part of the observation of learning intentions for the lesson. In the planning and preparation for the declared curriculum, the learning intentions for each lesson or sequence of lessons should connect to a 'big idea' as outlined in the Understanding by Design framework. Table 23 identifies the twelve departments observed during the study ranked by faculty that demonstrates the least amount of practice visibly connected to 'big ideas'.

An area of some concern in a school the size of Oakhill is inter-class variance which has been one of the drivers behind the online declaration of the REAL Program. This has been a confronting change to practice for many classroom teachers who were used to the high degree of professional autonomy of teaching.

Table 24 - Faculty Rankings in Terms of Felicity to Lesson Aims in Lesson Observations

Departments	Practice demonstrates felicity to lesson aims, and is connected to declared curriculum	RANKING
Music	73.7	1
Drama	80	2
Languages	82.55	3
Religion	84.6	4
Mathematics	85.7	5
PDHPE	88.5	6
Visual Arts	88.9	7
HSIE- History	90.9	8
HSIE- Geography	92.3	9
Science	93.8	10
Tech	95.35	11
English	96.5	12

This table demonstrates that practice demonstrates felicity to lesson aims, and is connected to declared curriculum is least demonstrated in the Music faculty, and the most in the English faculty.

The findings on feedback during the study was observed in three separate samples but is best considered as one single idea. By examining the data of 'some' and 'extensive feedback' from the lesson observations, the clearest understanding of the most effective faculties in terms of providing feedback during lessons to students can be gained. Examining all three instances of data, the rankings of faculties in terms of feedback are outlined in Table 25.

Table 25 - Faculty Rankings of Instances of Feedback in Lesson Observations

Department	No Feedback Ranking	Some Feedback Ranking	Extensive Feedback Ranking	Overall Feedback Ranking
PDHPE	12	10	1	7
Languages	7	12	2	5
HSIE- History	2	11	3	2
Religion	9	9	4	6
Mathematics	1	8	5	1
Science	11	6	6	7
Tech	4	7	7	3
Music	10	4	8	6
English	5	4	9	3
HSIE- Geography	6	3	10	4
Drama	7	1	11	4
Visual Arts	3	2	11	3

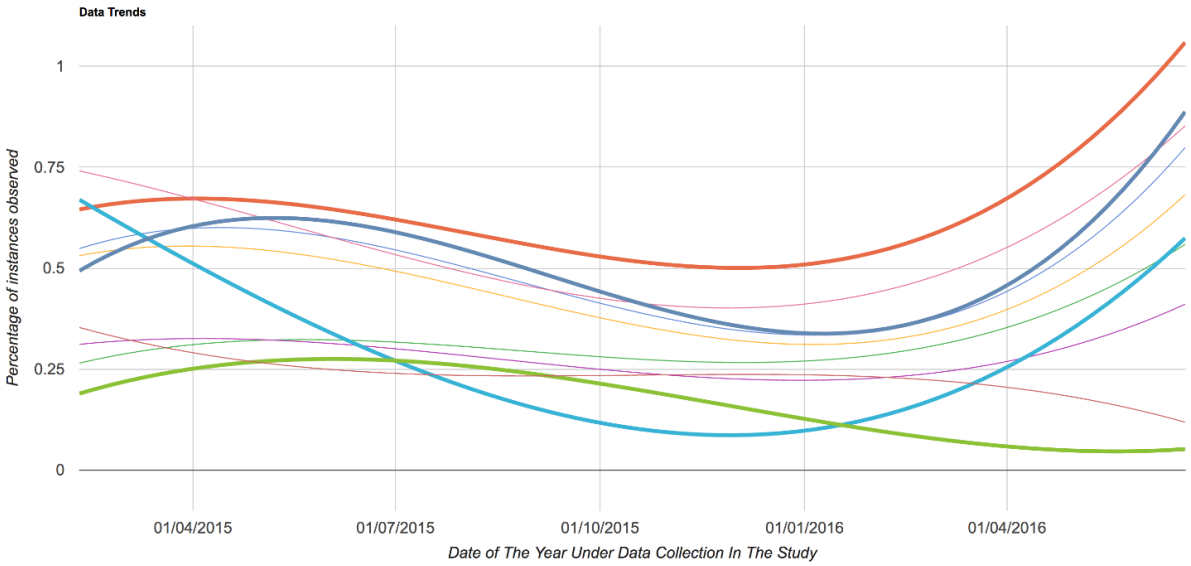
Using the researcher's notes from the various lesson observations over the three phases of data collection, there is a trend for more extensive and meaningful feedback from practical based exercises, thus faculties with high levels of practical, hands-on tasks offer more extensive feedback more regularly. The high overall ranking of Science, Music and PDHPE would reflect this finding.

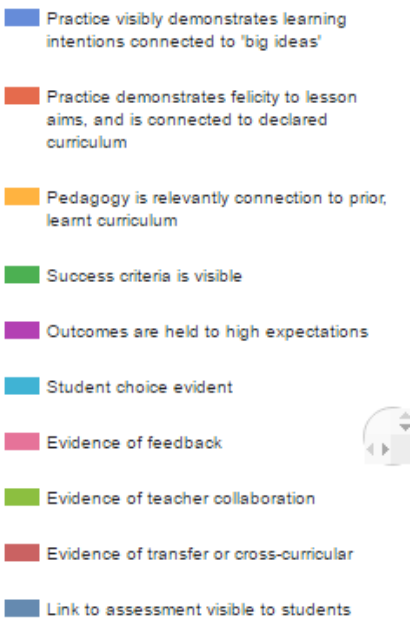
Table 26 - Faculty Rankings in Terms of Evidence of Teacher Collaboration in Lesson Observations

Departments	Evidence of teacher collaboration	RANKING
Visual Arts	0	1
Languages	5	2
HSIE- History	9.1	3
Religion	12.8	4
Music	15.8	5
Mathematics	15.9	6
Tech	17.37	7
Drama	20	8
English	21.1	9
HSIE- Geography	26.9	10
Science	27.1	11
PDHPE	61.5	12

Of all the measurements, evidence of teacher collaboration during lesson observations was the most lacking. While a faculty like PDHPE built a strong collaborative practice of joint lessons to maximise feedback opportunities for students and to harness the differing areas of syllabus expertise, most other faculties demonstrated little collaborative practice. Collaboration amongst staff was identified as a variable of large effect in the mid-way report. To counter the impact of a lack of time for collaboration, the College reduced the teaching load of 39.4 to 36 periods per fortnight cycle in 2016 to create three periods (a little over three hours) as professional learning allocation. While there has been evidence of improved opportunities for collaborative professional learning during this newly created time, there was no evidence to suggest an improvement in collaborative classroom practice, which can be seen in *Figure 12,* indicated by the bright green line. In fact, unlike most other domains measured in lesson observations, there was not even a rise in collaborative practice after the introduction of instructional rounds following Intervention 6.

Figure 12: Data trends from lesson observations

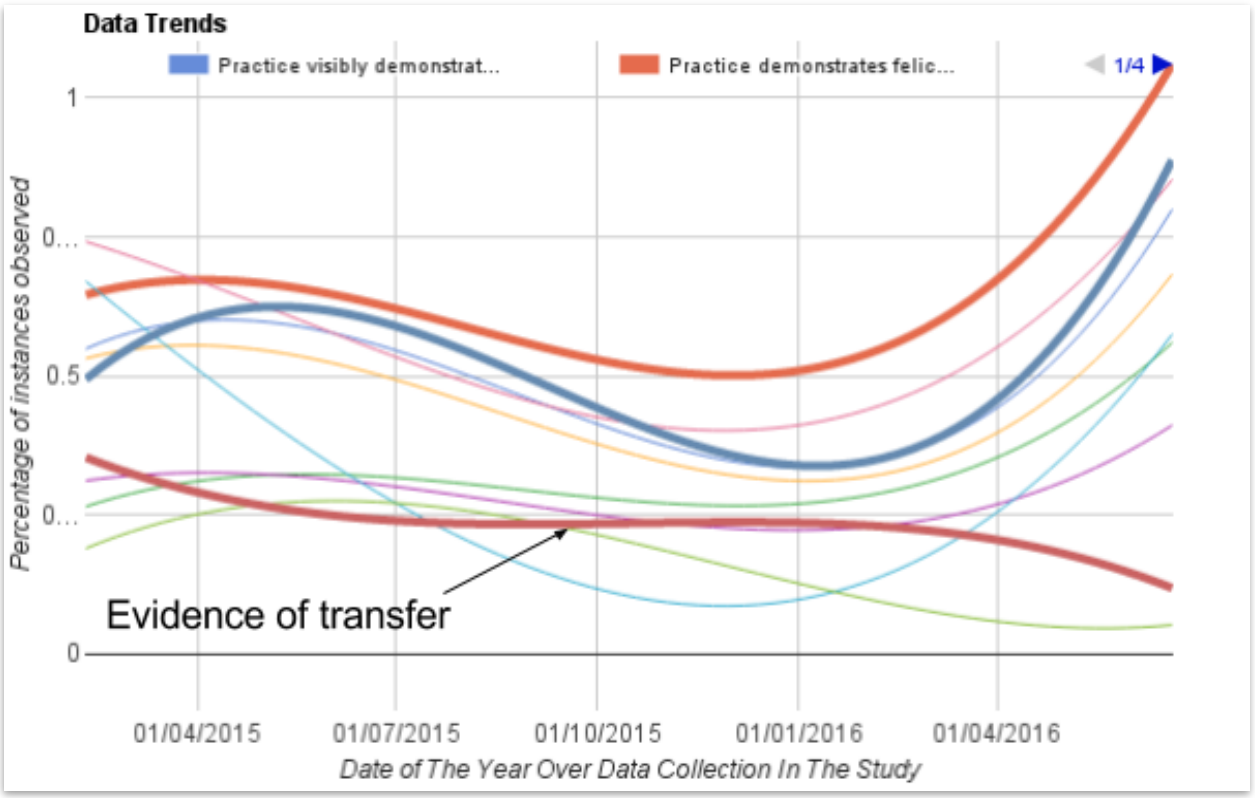




Evidence of transfer or cross-curricular connection was also low in terms of observed practice in lessons. This domain too, is on a downward trajectory in the trend lines from lesson observations, even after the introduction of instructional rounds in Term 2, 2016. Transfer is the final stage, or the most evident measure of deep understanding in the Understanding by Design learning framework.

> *[Transfer is] the ability to extend what has been learned in one context to new contexts. Educators hope that students will transfer learning from one problem to another within a course, from one year in school to another, between school and home, and from school to workplace. Assumptions about transfer accompany the belief that it is better to broadly "educate" people than simply "train" them to perform particular tasks.* Bransford, Brown, and Cocking (2000, p.51)

Figure 13: Evidence of Transfer



Results of the Pearson's r correlation analysis indicates that there was a strong positive correlation between the two variables "Outcomes are held to high expectations" and "Evidence of feedback (Extensive)", r = .792, N = 12, p =.002 <.01. This means that the more outcomes are held to high expectations, the more extensive feedback are provided among the faculties. Results of the linear regression on these two factors indicates that outcomes which are held to high expectations can be used to predict the Provision of extensive feedback as in the following formula: y = 33.43 + 0.56*x

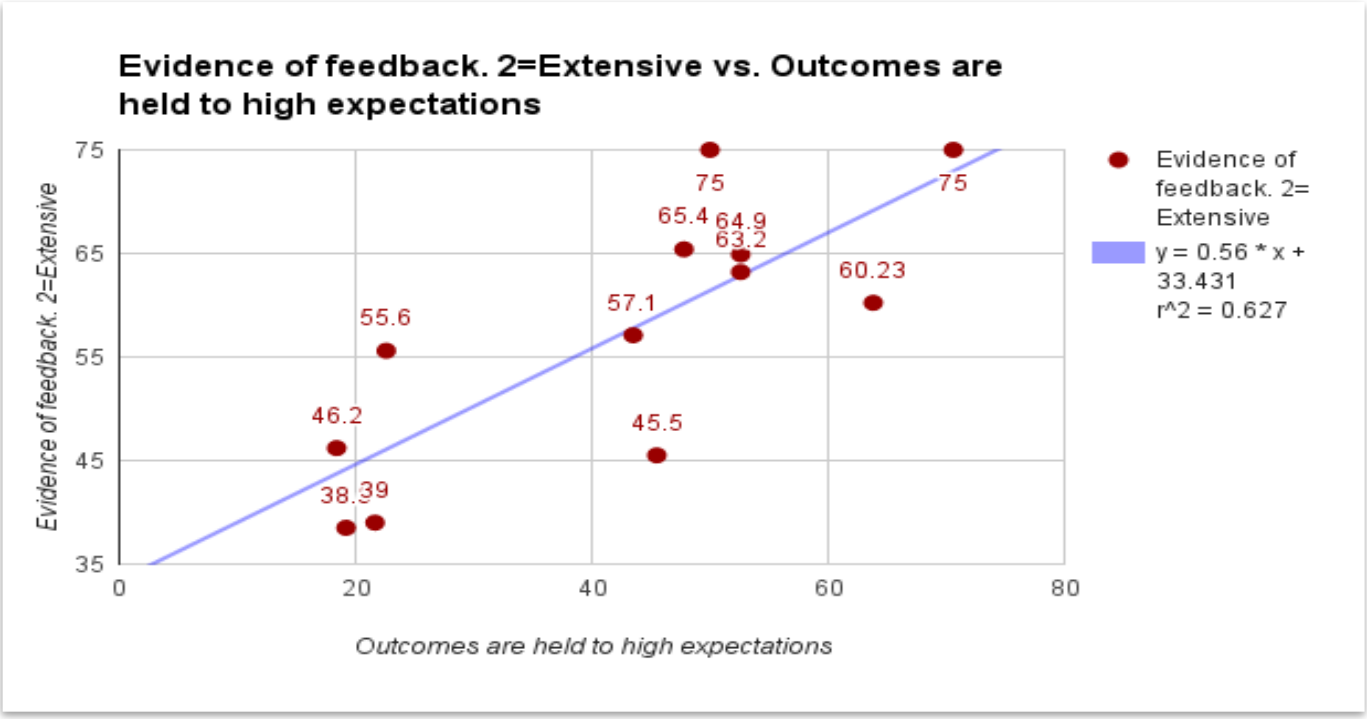
where

- y = Provision of extensive feedback
- x = Outcomes are held to high expectation

As x (outcomes are held to high expectation increases 1 unit, y (extensive evidence of feedback) increases 33.43 + 56 * 1 unit.

The scatterplot with the line of best fit below further demonstrates that there is a strong correlation between those teachers who set high expectations in the classroom and provision of extensive feedback.

Figure 14:



Another example of the impact of transparency and the shift towards student-centred pedagogy includes the questioning techniques applied in classrooms and their occurrence. A domain for observation in each lesson was a count of the type of questions. For this study, question types can be classified as outlined in Table 39.

Table 27 - Question Types

Category of Questions	Definition	Sub-Type	Example
Probing Questions	Series of questions which require students to go beyond the first response. Subsequent teacher questions are formed on the basis of the student's response.	**Clarifying**	*"Could you elaborate on that point?"* *"What did you mean by the term. . .?"*
		Increasing Critical Awareness	*"What are your reasons for thinking that is so?"*
		Refocusing	*"If this is true, what are the implications for . . . ?"*

		Prompting	*Teacher: "John, what's the square root of 94?"* *John: "I don't know." Teacher: "Well, what's the square root of 100?"* *John: "Ten." Teacher: "And the square root of 81?" John: "Nine."* *Teacher: "Then what do we know about the square root of 94?"* *John: "It's between nine and ten."*
		Redirecting to Another Student	*Teacher: "What is the theme of Hemmingway's 'Old Man and the Sea'?"* *Sam: "It's about an old man's courage in catching a fish."* *Teacher: "Mary, do you agree?"*
Factual Questions	Questions which require the student to recall specific information s(he) has previously learned. Often these use who, what, when, where, etc.	**Simple Bits of Information**	*"During which century did Shakespeare live?"*
		Facts Organized into a Logical Order (Sequence of Events)	*"What is the commercial method for producing hydrochloric acid?"*
Higher Order Questions	Questions which require students to figure out answers rather than remember them. Requires generalizations	**Evaluation: Requires judgment, value or choice based upon comparing of ideas or objects to established standards.**	*"Assuming equal resources, who would you rate as the most skillful general, Patton or MacArthur?*

	related to facts in meaningful patterns.	**Inference: Requires inductive or deductive reasoning**	Inductive: Discovery of a general principle from a collection of specific facts. *"We have examined the qualities these world leaders have in common. What might we conclude, in general, about qualities necessary for leadership? Why?" (Inductive)* Deductive: Logical operation in which the worth of a generalization is tested with specific issues. *"If the temperature of the gas remains the same, but gas is taken to an altitude of 4000 feet higher, what happens to the pressure of the gas? Why?" (Deductive)*
		Comparison: Requires student to determine if ideas/objects are similar, dissimilar, unrelated, or contradictory.	*"Is a mussel the same thing as a clam?"*
		Application: Requires student to use a concept or principle in a context different from that in which she/he learned it.	*Concept = Classification of events/objects that have common characteristics.* *Principle = A relationship between two or more concepts. "How was Gresham's Law demonstrated in the Weimer Republic of Germany?"* *"Can you think of an example to fit this definition?"*
		Problem-solving: Requires a student to use previously	Students must see relationships between knowledge and the problem,

		learned knowledge to solve a problem.	diagnose materials, situations, and environments, separate problems into components parts, and relate parts to one another and the whole. This question may generate answers the teacher hasn't anticipated. *"Suppose you grow up with the idea that dogs were bad. Out of the many dogs you came into contact with, none bit you when you were quite young. How would you react towards dogs now? Would the type, size, etc., of the dog make any difference as to how you react? Explain the notion of prejudices using this example."*
Structuring Questions	Questions related to the setting in which learning is occurring.		*"Is the assignment clear?"* *"Are we ready to continue?"*

The instances of each category of questioning were counted in each lesson observation and then analysed by faculty. Two types of analysis were undertaken for overall questioning and then for each category of questioning. There were some statistically significant findings across the faculties, in particular, in the higher-order questioning category.

Table 28 - Descriptive Statistics (presenting means in ascending order—from lowest to highest mean)

	N	Range	Minimum	Maximum	Mean	Std. Deviation
Number of structural questions.	382	11	0	11	.84	1.457
Number of higher order questions.	381	17	0	17	1.71	2.833
Number of probing questions.	383	19	0	19	3.81	3.332
Number of factual questions.	383	37	0	37	5.01	4.535
Valid N (listwise)	378					

- This table demonstrates the descriptive statistics of the 4 types of questions asked/performed by the surveyed staff across 12 faculties.
- While there are 384 cases (staff) surveyed across 12 faculties, the corresponding total N for each type of questions does not equal 384 given the missing values (values were not entered).
- This shows that the lowest number of each type of questions asked is 0 for across 4 types of questions, and the highest number of questions asked is 37 for factual questions.
- Structural questions have the lowest mean (0.84) – or that they are least asked in comparison to other types of questions, whereas Factual questions have the highest mean (5.01) or that they are most asked in comparison to other types of questions

Table 29- Number of Probing Questions Descriptives

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Drama	13	3.54	5.027	1.394	.50	6.58	0	19
English	52	3.67	3.288	.456	2.76	4.59	0	18
Geography	26	3.65	3.162	.620	2.38	4.93	0	15
History	10	4.60	2.271	.718	2.98	6.22	0	8
Languages	21	2.33	2.129	.465	1.36	3.30	0	6
Maths	67	4.75	3.599	.440	3.87	5.62	0	19
Music	20	6.50	4.033	.902	4.61	8.39	2	19
PDHPE	27	4.63	3.660	.704	3.18	6.08	0	15
Religion	35	4.14	3.164	.535	3.06	5.23	0	14
Science	50	3.48	2.873	.406	2.66	4.30	0	11
Tech	45	2.13	2.262	.337	1.45	2.81	0	9
Visual Arts	17	2.65	2.262	.549	1.48	3.81	0	7
Total	383	3.81	3.332	.170	3.48	4.15	0	19

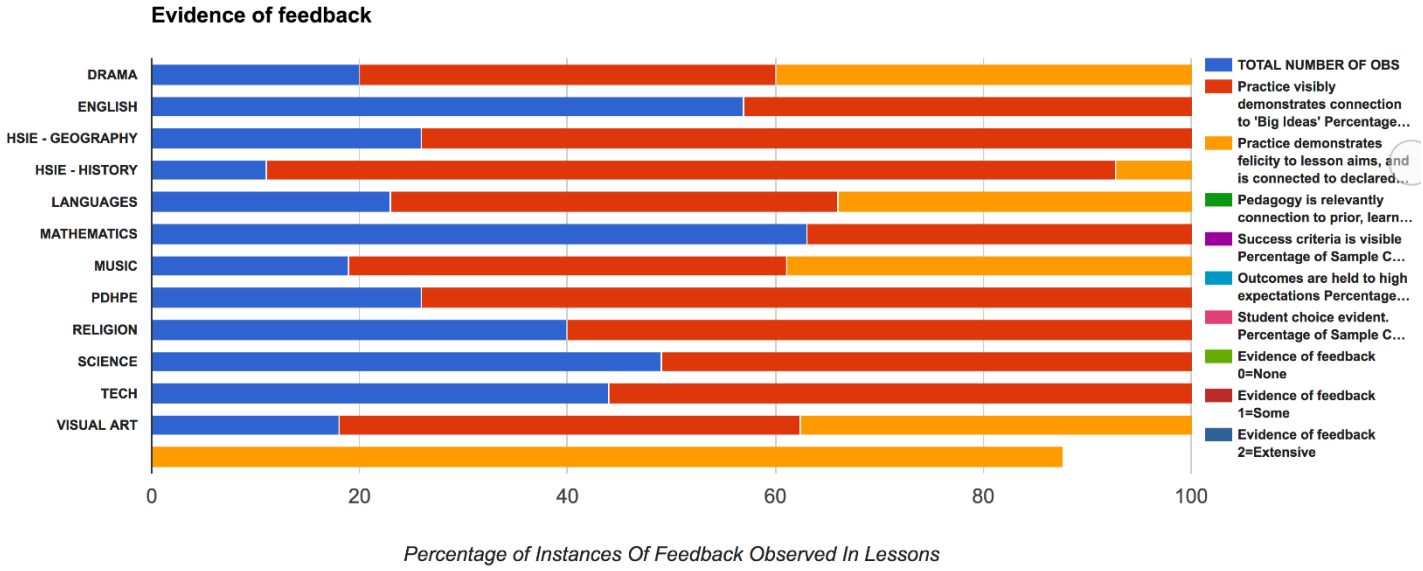
Table 30 - Higher Order Questioning Descriptives

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Drama	13	.69	1.377	.382	-.14	1.52	0	4
English	51	1.61	2.219	.311	.98	2.23	0	7
Geography	25	1.20	1.732	.346	.49	1.91	0	5
History	10	1.80	2.616	.827	-.07	3.67	0	8
Languages	22	.91	1.823	.389	.10	1.72	0	6
Maths	67	3.99	4.554	.556	2.87	5.10	0	17
Music	19	1.68	1.565	.359	.93	2.44	0	5
PDHPE	27	1.56	2.118	.408	.72	2.39	0	7
Religion	35	1.43	2.570	.434	.55	2.31	0	11
Science	50	1.20	2.109	.298	.60	1.80	0	9
Tech	45	.64	1.554	.232	.18	1.11	0	6
Visual Arts	17	.82	1.510	.366	.05	1.60	0	5
Total	381	1.71	2.833	.145	1.43	2.00	0	17

Parents, staff and students have identified the importance of feedback. Staff in particular appeared to demonstrate improved understanding, “They are keen to know where they went wrong so individual feedback is important.” Parent and student expectations attached to feedback and the shared language around feedback over the three phases of focus groups indicated, “Specific feedback to parents could be improved more”. Feedback is acknowledged by all stakeholders as extremely important, appearing throughout each phase of data collection. The desire for more specific, timely and directive feedback from students is in direct correlation with their hope for deeper learning, more hands on and active experiences with a personalised engagement with the work and their teacher, “Students thrive on it. Works twice as hard for that teacher.” However, there appears to be a gap in understanding amongst all stakeholders regarding what constitutes feedback and how it should be given, “Merits, great instant feedback.” The misconceptions about praise as feedback permeate the findings in all focus groups.

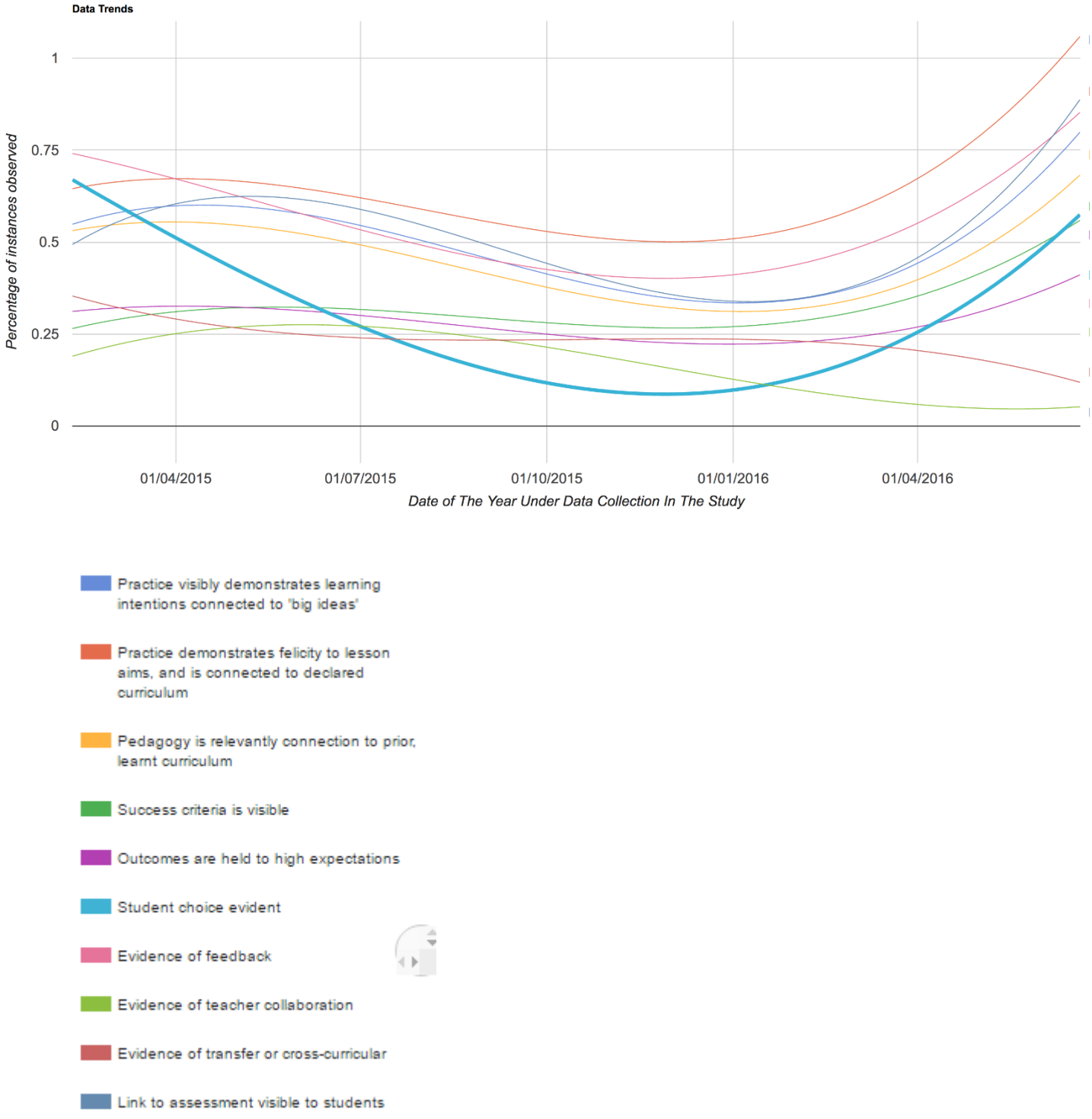
Significant time and professional development has been allocated to all teaching staff on feedback, including a whole school professional development day as the final intervention in the project, “Specific feedback to parents could be improved more”. The staff focus group in Phase 3 was timed after Intervention 5, which was a whole staff day for all staff working at Oakhill College on the importance of feedback. In the focus group a staff member commented that, “I give feedback purely on assessments. Maybe I need to do this more on class work. A mark of 65% means what?” However, it appears that the failure to recognise the importance of directing students ‘where to next’ is linked to broader issues about teacher identity and deep seated gaps in pedagogical understanding identified in earlier tables.

Figure 15: Faculty Evidence of Feedback



Aligned with this reticence to see the value of student access to a success criterion, student choice as a whole is an area that has not improved at a positive rate. Student choice is associated with the opportunity to work at their own pace, their option to choose a mode of presentation of learning, opportunities to choose content or area of interest in classwork or to work in a group of their own choice. Student choice was mentioned earlier in the findings on the declared curriculum as an element of a Quality Learning Environment Domain in the Quality Teaching Framework Assessment analysis. During the lesson observations, student choice was also measured and identified as one of the least demonstrated of the 12 domains with student choice only evident in 52.98% of lesson observations and was most frequently applied by the Geography faculty. Table 46 demonstrates that student choice is least demonstrated in the Music faculty. The bright blue trend line at the bottom of *Figure 16* represents student choice across the six terms of data collection, and despite being one of the domains that dropped dramatically in evidence during lesson observations, there was an upswing in the beginning of 2016 which possibly correlates with the same units taught during the same period in 2015.

Figure 16: Student Choice Measurement from Lesson Observations



Student choice can be identified in the declared and taught curricula. Faculties can promote student choice in their programming and assessments, while individual class teachers can add to the choice in their own application of the curriculum.

In the Phase 2 teacher survey, a survey of all teachers of the 2015 Year 7 cohort, 82.8% of the teaching staff who were applying the declared curriculum identified that they rarely or sometimes offered opportunities for student choice. Only 3.1% of staff nominated that it was a regular part of their practice.

Table 31- Student Choice Evidence

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	**0**	9	14.1	14.1	14.1
	1	23	35.9	35.9	50.0
	2	30	46.9	46.9	96.9
	3	2	3.1	3.1	100.0
	Total	64	100.0	100.0	

** 0 = none, 1 = rarely, 2 = sometimes, 3 = regularly*

Students are adamant, with some of the most standout responses in the focus group interviews, that they do not want teacher talk, they want relevant work that they do themselves. The focus groups consistently revealed that students find that some teachers talk far too much in lessons, commenting that there is too much “waffling on about the task, just tell me what I need to do” and “be more direct, don’t waffle around the idea”.

Throughout the study, lesson observations timed the amount of lost time, teacher talk and student work. The teacher talk was categorised into instructional, procedural or regulatory. Instructional talk could be classified as the traditional form of the teacher instructing the class from the front of the room with content. Procedural talk is defined in this study as a teacher providing information about work that students are carrying out, this may include

instructions for the next part of a lesson activity, or checking for understanding before moving on. Regulatory talk is defined in this study as a teacher speaking to regulate class behaviour, to correct off task behaviour or encourage compliance with regulation. Over the three phases of data collection, the following data was collected and analysed to quantify the amount of teacher talk, student work and lost time in lessons.

One-way analysis (ANOVA) on Total Teacher Talk Time across 12 faculties

Anova was carried out to determine if there is a statistically significant difference in the Total Teacher Talk Time across 12 faculties.

Table 32 - Teacher Total Talk Descriptives

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Drama	17	14.6471	5.34955	1.29746	11.8966	17.3975	2.00	24.00
English	43	20.9767	11.90336	1.81525	17.3134	24.6401	5.00	62.00
Geography	16	15.2500	10.21437	2.55359	9.8071	20.6929	3.00	41.00
History	9	22.1111	9.58442	3.19481	14.7439	29.4783	12.00	39.00
Languages	19	20.4211	9.42406	2.16203	15.8788	24.9633	8.00	50.00
Maths	51	26.0196	11.39560	1.59570	22.8145	29.2247	4.00	59.00
Music	17	22.9412	14.09109	3.41759	15.6962	30.1861	4.00	46.00

PDHPE	21	19.8095	8.15242	1.77900	16.0986	23.5205	9.00	40.00
Religion	29	20.3448	11.08820	2.05903	16.1271	24.5626	4.00	49.00
Science	40	19.8250	9.03522	1.42859	16.9354	22.7146	3.00	45.00
Tech	32	15.2500	12.42007	2.19558	10.7721	19.7279	1.00	51.00
Visual Arts	13	21.6154	10.78995	2.99259	15.0951	28.1357	10.00	43.00
Total	307	20.4137	11.10680	.63390	19.1663	21.6610	1.00	62.00

Ranking of 12 faculties per Average Total Teacher Talk Time

Based on this analysis, ranking of 12 faculties per Average Total Teacher Talk Time indicates (see Table 32) that teachers in Drama faculty spent least time talking (mean = 14.6471) whereas teachers in the Maths faculty spent most time talking (mean = 26.0196).

Table 33 - Faculty Teacher Talk Time Ranking

Faculty	Average Teacher Talk Time	Ranking (Least to Most Time)
Drama	14.6471	1
Geography	15.25	2
Tech	15.25	3
PDHPE	19.8095	4
Science	19.825	5
Religion	20.3448	6
Languages	20.4211	7
English	20.9767	8
Visual Arts	21.6154	9
History	22.1111	10
Music	22.9412	11
Maths	26.0196	12

Results of ANOVA indicates there is a statically significant difference between the 12 faculties in terms of the Total Teacher Talk Time F (11, 295) = 2.859, = p = .001 < 0.01 (see table below).

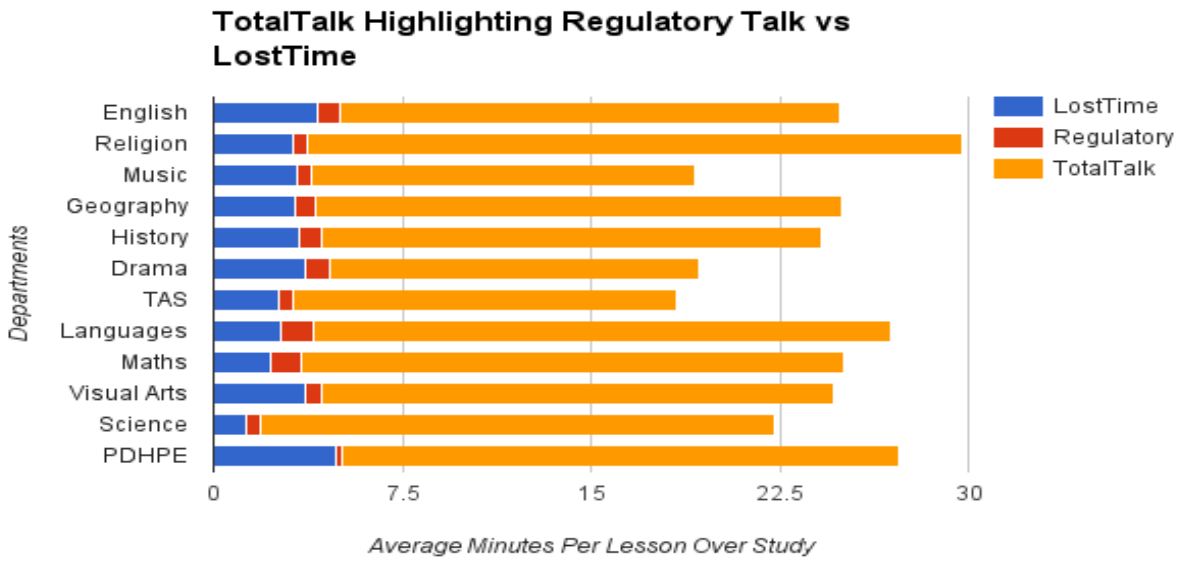
Table 34 - ANOVA Teacher Total Talk Time

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	3636.520	11	330.593	2.859	.001
Within Groups	34111.943	295	115.634		
Total	37748.463	306			

Students identified that they can't learn when their wellbeing is compromised and when there is not an atmosphere of control in the classroom; a typical student quote from the focus groups was, "Teachers probably need to calm down". As a student indicated in the Phase 2 focus groups, "In my opinion there is not enough of the teacher trying to get rid of distractions".

Lesson observations revealed that on average little time was spent on regulatory talk, which would indicate little off task behaviour. Additionally, observations recorded less than two students demonstrating off task behaviour per lesson, hence REAL Program classes would appear to be highly compliant. It is difficult to make this statement with any certainty however, as there is undoubtedly an impact of the observer being in the room.

Figure 17: Faculty Total Talk Time



Focus groups revealed homework as an increasing area of concern for students, parents and staff. Students are keen to work on assessments; a student in the Phase 2 focus groups identified that, “I want to focus on assessments but homework gets in the way”. Parents also identified homework lacking relevance or connection to assessment or classwork, “The homework seems to be too obscure”. Homework serves as a source of stress for parents, “Homework is an issue, overwhelming, there is too much homework given and students spending hours on it.” Students and staff also indicate that homework is more of an issue in the transition year of high school, differing significantly from approaches in primary school.

Figure 18: Indicates the amount of hours spent completing homework

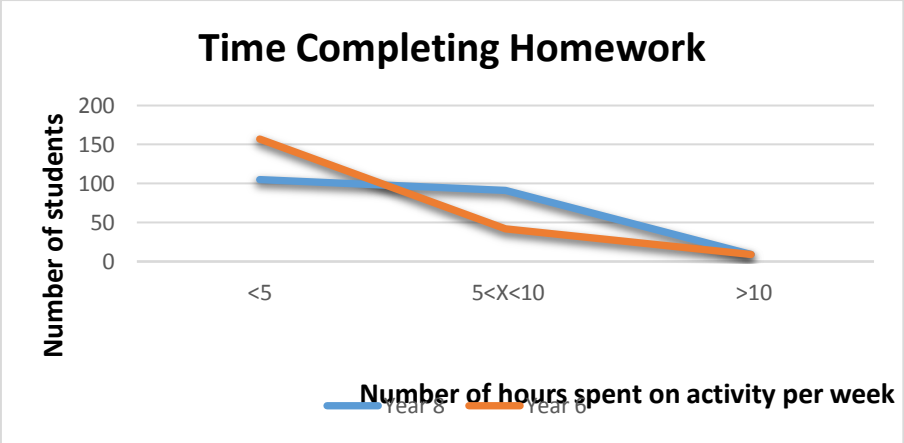
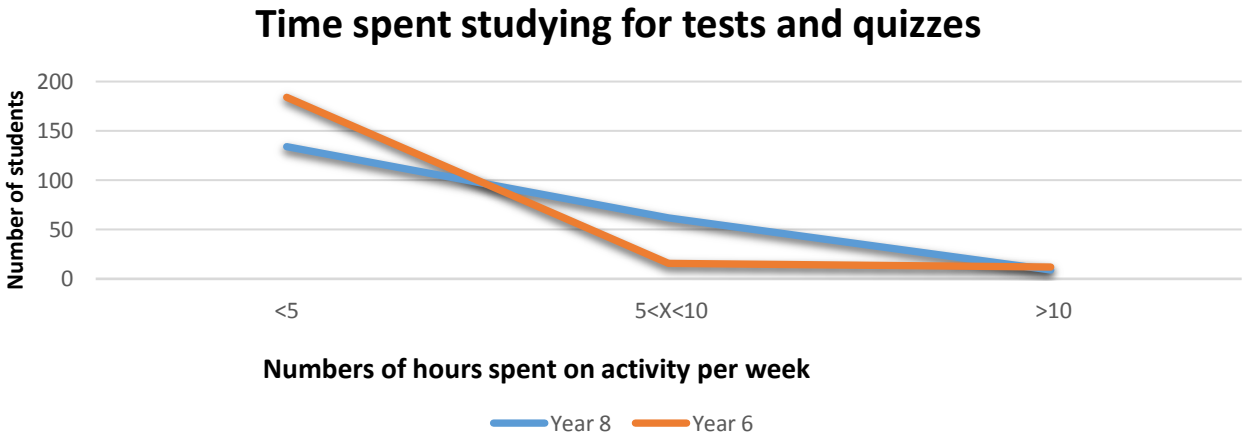
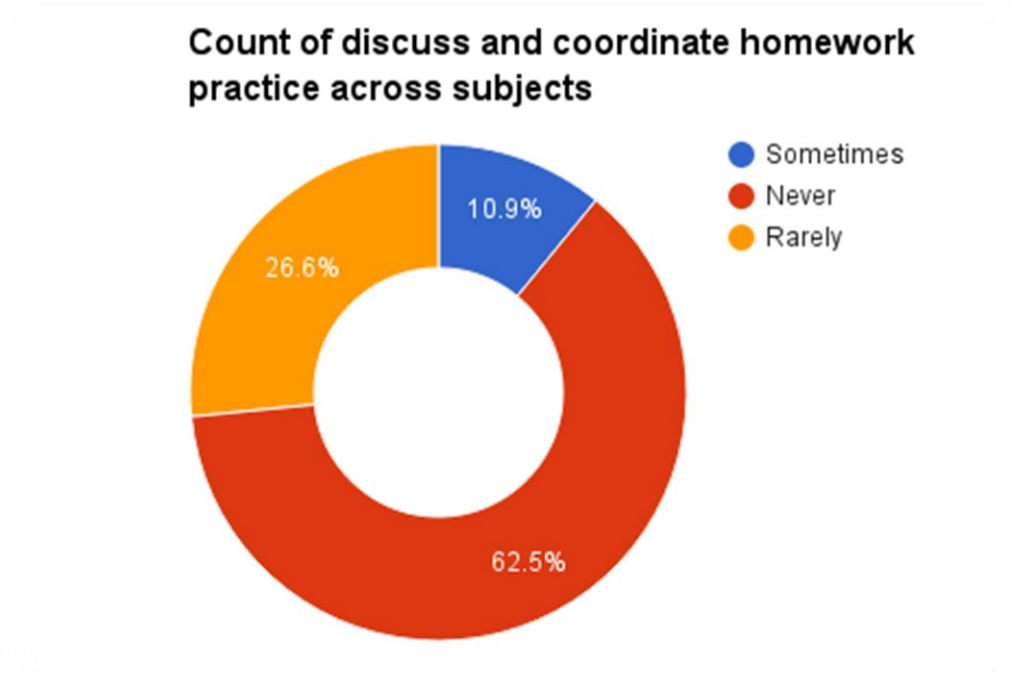


Figure 19: Indicates the amount of hours spent studying for tests and quizzes



Teachers identified in the survey at the end of Phase 2 indicated that there is very little discussion across the faculties in terms of homework.

Figure 20: Indicates the involvement of classroom teachers in coordinating cohesive learning structures and practices around homework



The staff focus groups reflected some movement in a high number of the teaching staff in the College towards more contemporary, considered and reflective practice that is focused on the individual student through a student-centred approach. The broadening gap between those who are 'on board' with REAL and those who do not understand the pedagogy is highlighted in responses in the final phase of the data collection.

In Phase 1, there were firmly those staff who were willing to learn, "I have to change my teaching, but this a good thing because it gives the teacher an opportunity to try another style/activity. You get to try different things that you wouldn't have considered and this expands the teacher's methods." There were also those who were sceptical, "REAL will not work with Maths as there is a range of ability." Across the three phases of data collection, the trend has surfaced where those who take the opportunity to learn about the pedagogy and reflect on their own practice are seeing the benefits to student outcomes, "A single program with universal access creates consistency." Those with strong resistance to changes that impact on teacher identity and require them to work to update their practice, resources and tools, continue to resist, REAL "makes people not want to change as it is a lot of work." There are also those who are non-compliant and reject any evidence of improved

student outcomes. As a parent indicated in the focus groups, “Some teachers are upfront and say to kids, ‘we don’t do it’.”

The Phase 3 teacher survey was only presented to those teachers who had been REAL Program teachers from the pilot year in 2014, through the entire 18 months of the study.

Figure 21: Has the REAL program impacted negatively on your practice?

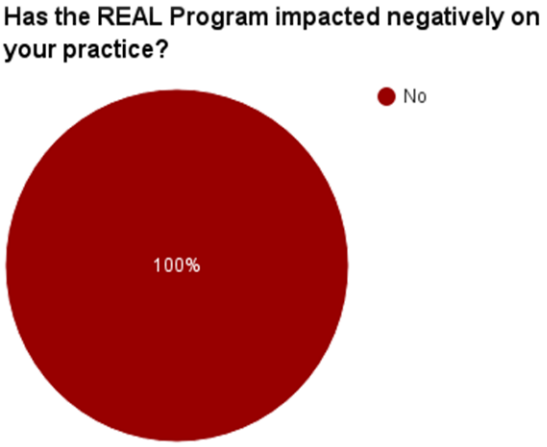
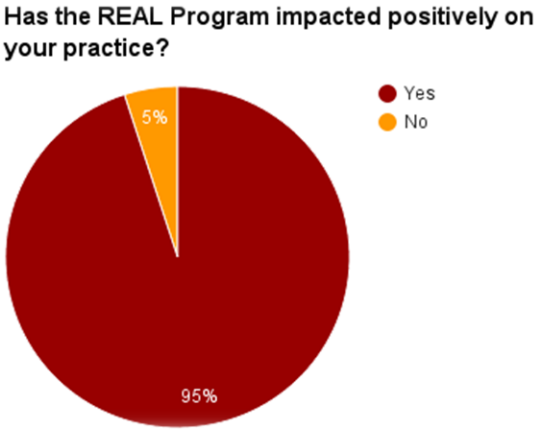


Figure 22: Has the REAL Program impacted positively on your practice?

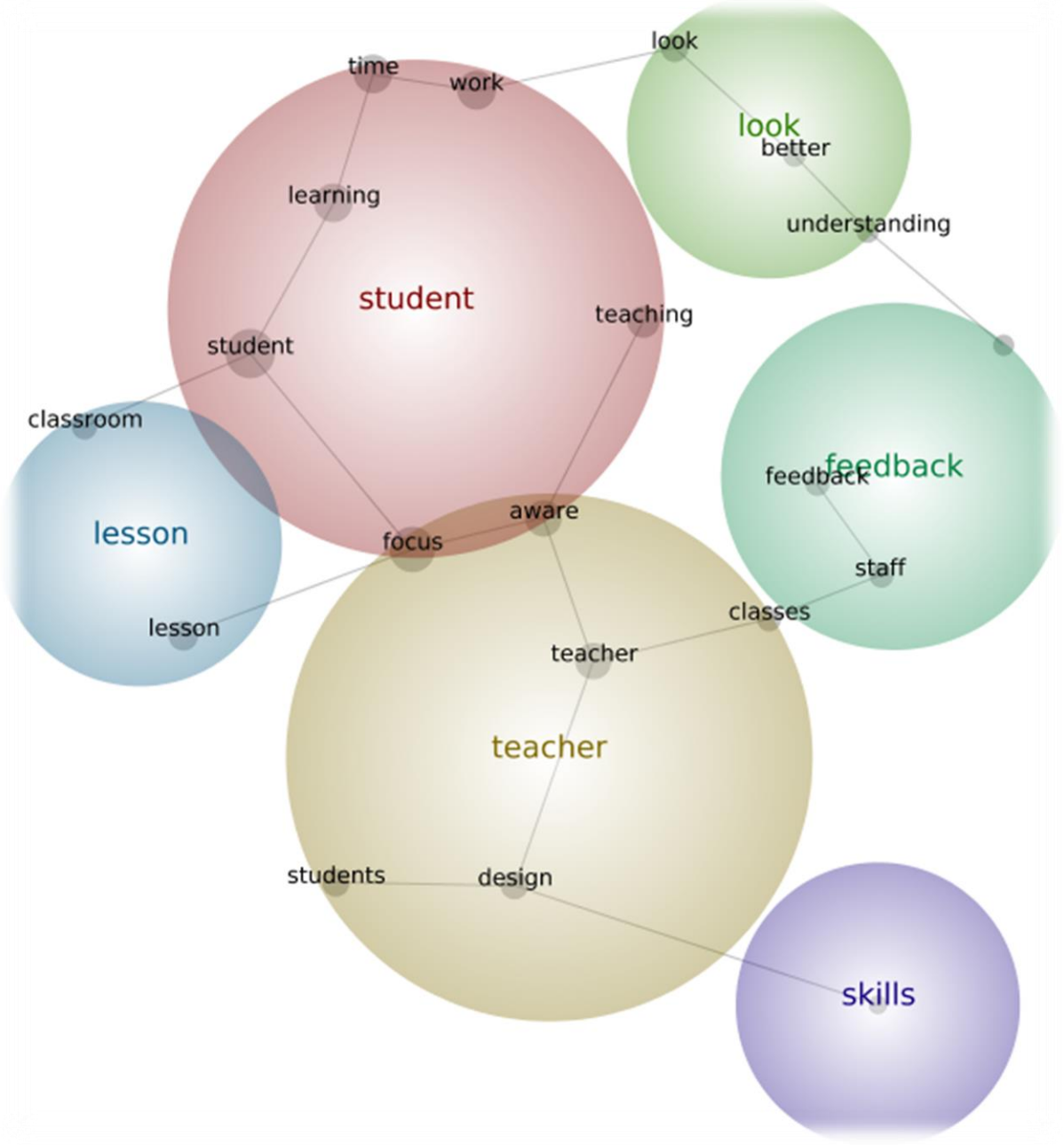


The representation of the qualitative data captures the significant improvement transparent curriculum declaration has had on teacher practice in the eyes of those teachers most affected by the changes. This improvement will ultimately be reflected in student outcomes. Transparency was identified in 100% of teacher responses from the Phase 3 survey as an influence featured in the positive impacts on professional practice. An example of the types of quotes from staff in the survey include, “...transparency of programs/scope and sequence

allows kids to see where we are going; offers clear connections between learning and understanding and is being able to expand out, and in, to show what the learning will look like." The theme of 'look' stands out as one of the positive impacts on teacher practice and can be identified in *Figure 22.* This finding will be a large part of the discussion section to follow.

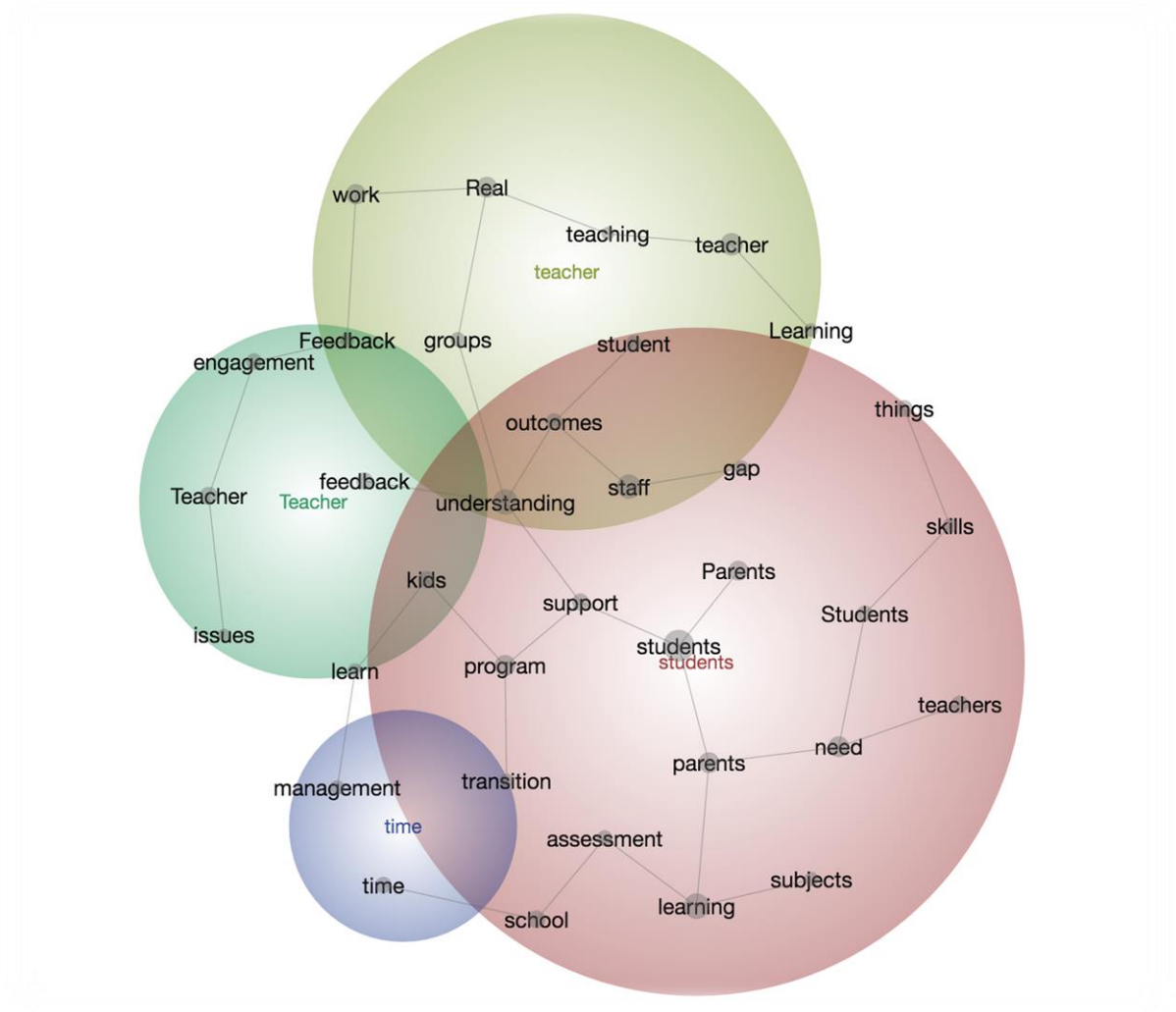
Self-efficacy is a prominent undercurrent in the support or resistance of the REAL program amongst staff. Those staff who believe that their role as a teacher aligns with a transparent, collaborative and relevant practice that is student-centred, have flourished under the pedagogy, "I love the REAL program. I know where I am going, kids know where they are going and parents know where they are going." Those staff who are of the firm belief that the program impinges on their identity as a teacher struggle with one or more elements of the program, "I feel like my role as a teacher has been taken away." The major themes identified in the thematic analysis of the qualitative data captured in the focus groups from the three phases of data collection were; student, teacher, lesson, look, feedback and skills. A close look at these themes would strongly suggest the balance of teaching and learning has been altered due to the shift towards more student-centred pedagogy. As is indicated in *Figure 23* the theme of teacher over student is slightly more significant but the concepts and connections highlighted within the themes of teacher and student may add some clarity to this prominence. Concepts like time, work and learning are central to the student theme, while in the concepts linked to teacher, classes, design and students stand out; perhaps reflecting the student-centred pedagogical shift.

Figure 23: Gaussian analysis of the Phase 3 staff survey question on positive impacts of the REAL Program on practice



The interrelationship of ideas taken from the hours of focus group discussions by teachers, in the case of *Figure 23*, is encouraging. An interesting finding from this analysis is the area in *Figure 23* where the themes of teacher and student overlap. The concepts shared in the connected areas are 'focus' and 'aware'. These concepts in the intersection between teacher and student, from the perspective of the teacher in teacher focus groups, are a strong indicator of the shift toward more student-centred pedagogy. What is also significant from this analysis is the theme of 'look', where the concepts of better understanding are highlighted as significantly interrelated in the discussion.

Figure 24 - Gaussian analysis of the 3 phases of focus group data



Finally, there is a subgroup of teachers who are simply resistant to any change.

Figure 24 shows a clear indication of the prominence of the student theme over the teacher theme when all focus group data over the three phases of data collection was analysed together. The smaller of the two circles to indicate the theme of 'Teacher' is connected to the teacher as a professional. The quotes from the focus groups that support this theme are around the professional expectations of the community about what the role of a teacher is/ The larger of the two green circles with the theme of 'Teacher' at the centre, under closer analysis of the highlighted concepts, relates to individual teachers and what they think of themselves. What is of most interest from this visualisation of data is the intersection between teacher and student where an interrelationship of concepts including, student, outcomes, staff, understanding, and gap was identified. This finding is supported by the researcher's notes from all members of the research team, and can be identified in the

classroom observational data. When a teacher demonstrated significant gaps in pedagogical understanding of the REAL program, student outcomes were affected. These effects could include less time for student work due to more teacher talk time, fewer high order questions on offer in lessons and weaker connections to the 'big ideas' of the declared curriculum.

The final area of interest indicated in *Figure 24*, is the significance of 'time' as a theme. Linked to concepts of management and transition in particular, there is an undeniable influence of time on the ability of transparency and a shift to more student-centred pedagogy and effects on student outcomes. The influence of time has been mentioned in focus group discussions, staff survey responses and appears consistently in each of the researcher's notes. Parents identified that they want more time to learn about the ways students work and how to use the IT platforms of the REAL Program. Students identified that they wanted more time to spend on concepts when they learn them, options for deeper learning in particular. Teachers were adamant that more time to plan and develop and improve their own skills and understanding would be of benefit.

Findings On the Learned Curriculum

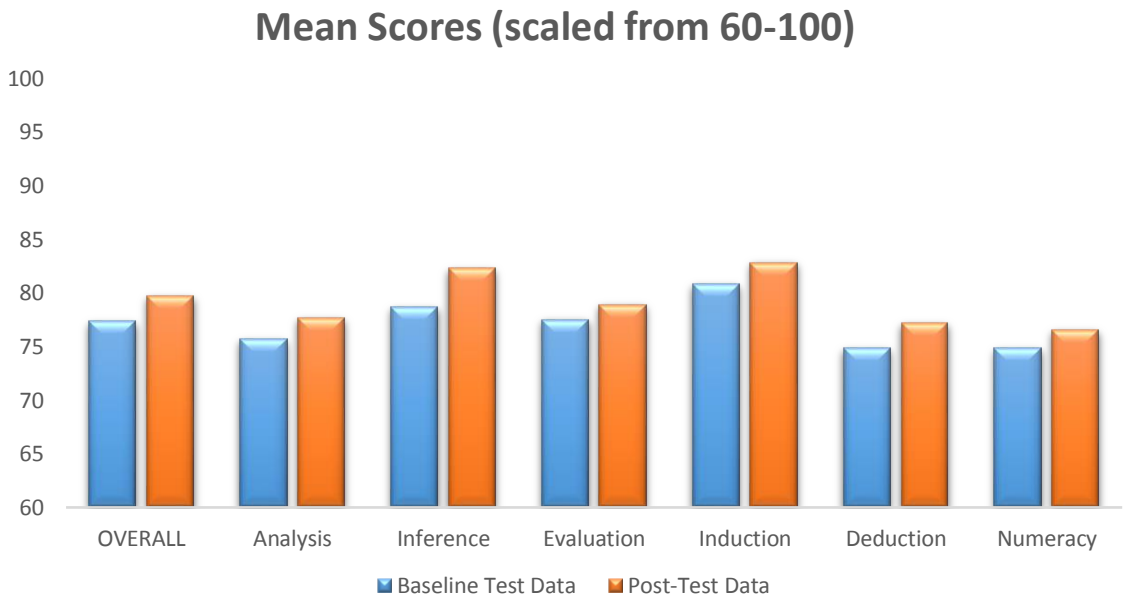
To measure the impact of a transparently declared curriculum and a shift towards student-centred pedagogy on critical thinking, the California Critical Thinking Skills Test online cognitive skills testing was administered to the study cohort, commencing with a Pre-Test/Baseline as Year 7 in May 2015, followed by a Post-Test as Year 8 in July 2016. Analysis demonstrates statistically significant growth in Overall results, in all six skills. Oakhill's results demonstrated a significant improvement in student performance, with overall Post-Test scores increasing by 14% compared to Baseline testing. One purpose of this analysis has been to confirm that there is *enough evidence* that students' abilities have genuinely improved. To do this without bias, a Statistical "Test of Significance" knowns as a T.Test has been used. The result of this is a 99.99% probability that there has been genuine underlying growth.

There was statistically significant growth in both overall mean and median results, and statistically significant growth in all of the six skills. A degree of reshuffling of performance

across the cohort occurred, with correlations between Baseline and Post-Test in the order of 40-55% also evident. This is likely a reflection of the significant experiences that students have undergone between May 2015 and July 2016.

More than three times as many students performed in the "Superior" band in Post-Testing for Overall scores (28 in the Post-Test compared to 8 in the Baseline). The number of students in the "Strong" band reduced, however those moving up into the "Strong" band offset movement into this band from "Not Manifest" and "Emerging". Many students who performed in the "Not Manifest" or "Emerging" bands moved out of this zone, while a smaller number fell in. Lists of students fitting both categories are included. It was acknowledged the level of seriousness with which students took the test might affect the results. To this end, six results in which students spent less than ten minutes on the Post-Test were excluded from the comparison. It was reported some of these students accidentally pressed "Submit" instead of "Next", an issue with the online test which will be mentioned to the testing company. It is apparent in viewing the charts presented that there has been a discernible improvement in results.

Figure 25: T.Test Evidence



A Statistical T.Test enables us to conclude scientifically that there has been a change in the "underlying average" of students' abilities, as opposed to the differences being good fortune. T.Tests performed indicate the following:

Table 35 - T.Test Indications

	OVERALL SCORE	Analysis	Inference	Evaluation	Induction	Deduction	Numeracy
Probability Underlying means are not equal	99.99%	99.89%	99.99%	99.07%	99.74%	100.00%	99.69%

All of these results far exceed the 95% threshold generally used in Statistics to conclude that there is sufficient evidence of growth.

Given the extent of experiences students will have undergone between Term 2 in Year 7 and Term 3 in Year 8, it is not surprising that there has been a degree of "changing of the guard". A correlation near 100% would indicate an unchanged order, while negative 100% would indicate a complete reversal.

Table 36 - Correlation Data

	OVERALL SCORE	**Analysis**	**Inference**	**Evaluation**	**Induction**	**Deduction**	**Numeracy**
Correlation	53%	44%	46%	46%	51%	45%	41%

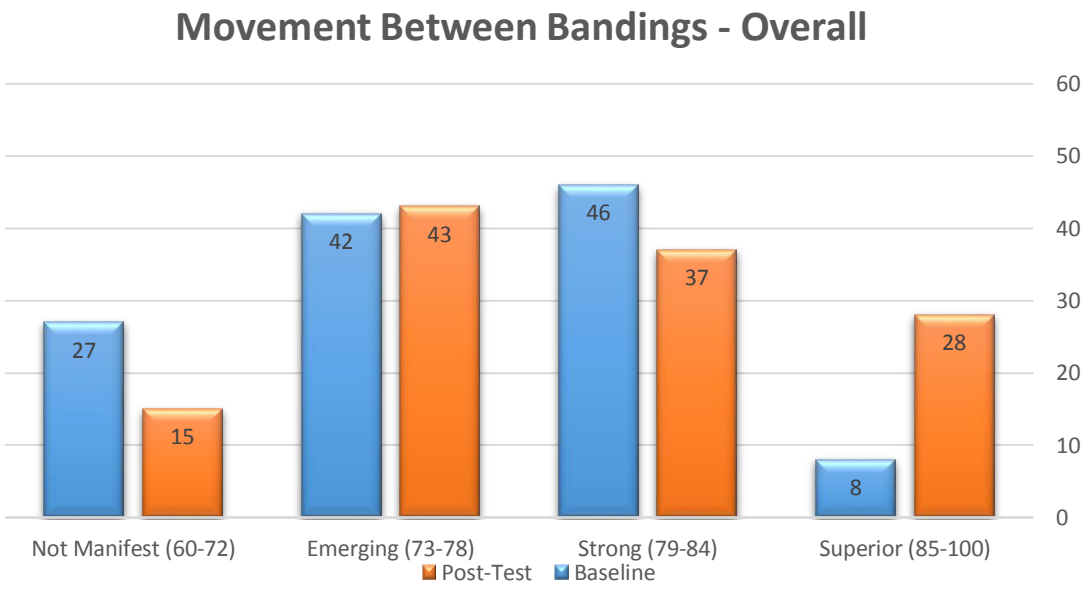
These correlations indicate a degree of changing in order, supported by charts showing result comparisons for individuals, with many lower-and-mid-order Baseline students achieving higher scores in Post-Testing.

For each skill, students are assigned a result between 60 and 100, with four bandings:

- Not Manifest: 60-72 // Emerging: 73-78 // Strong: 79-84 // Superior: 85-100.

It is important to recognise the meaning of these bands and they give context to results, in terms of a student's development.

Figure 26: Movement between Bands



Along with measured impacts on critical thinking, the study has tried to observe broad academic performance of the cohort. Each semester report over the three semesters of the project was compared for growth in overall academic achievement in terms of marks. Viewing the growth of individual students over the 18 months of data collection can see some interesting data. 59% of the cohort demonstrated growth from Semester 1, 2015 to the end of Semester 2, 2016. 26% of these students grew the average of their marks by 4 marks or more. These results are merely a guide as to progress. There has not been any statistical measure of significance used in the analysis of this data due to the amount of variables that would need to be tested. The graphs in *Figure 27* and *Figure 28* represent individual growth over time and individual comparison of average marks of the three semesters reported. When compared with the Year 10 cohort who has not been a part of the REAL program, there is evidence of the impact effect. Again, the multitude of variables makes it impossible to conclusively support a direct line of correlation between the impact of the REAL Program and student growth. However, there is a pattern of growth in all of the measures of academic improvement for the cohorts that have worked in the program, whether they are school or external tests.

Figure 27: Individual Student Academic Growth over Project

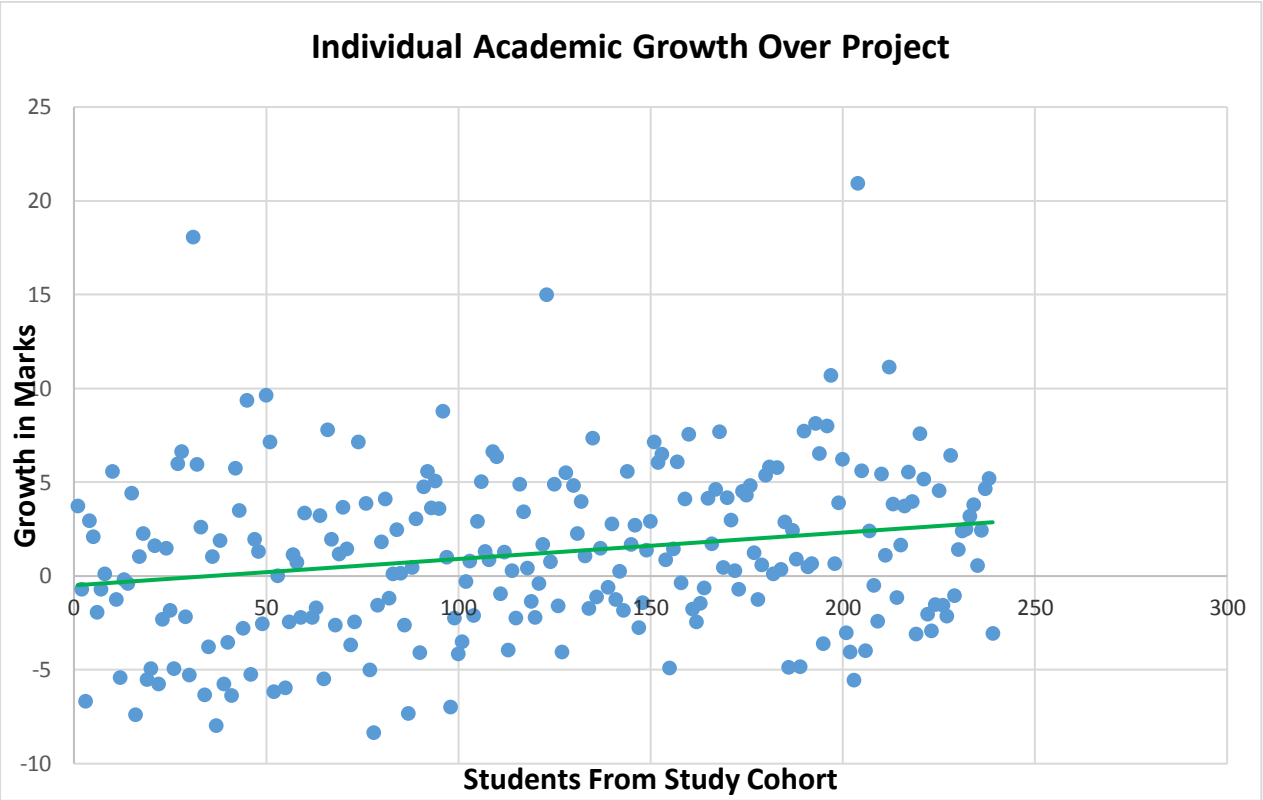
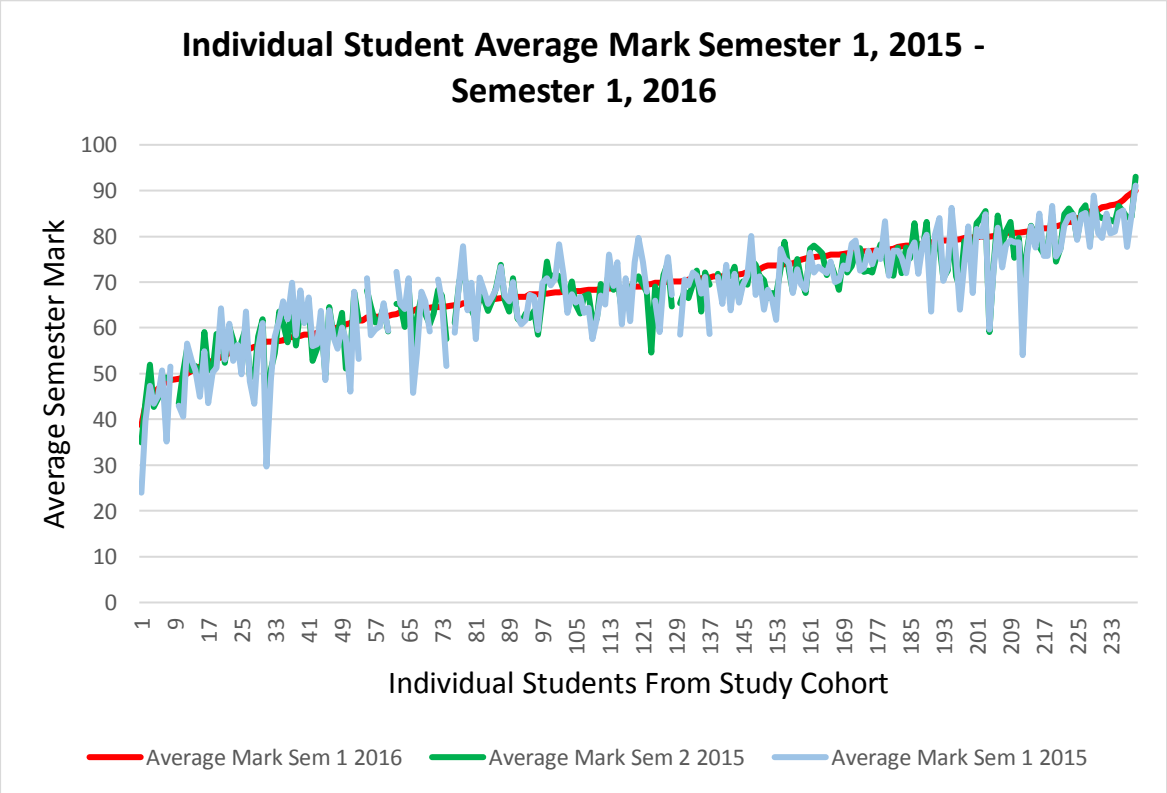


Figure 28: Individual Student Mark over Project



The final data set of findings to highlight student outcomes comes from the series of Allwell tests run in 2015 and September 2016. These tests measure student performance across general reasoning, verbal reasoning, non-verbal reasoning, reading, writing, and numeracy. The series of figures below demonstrate the comparison between the study cohorts' results in the two tests represented in bands and then in general growth scores.

Figure 29: Allwell Writing Measurement

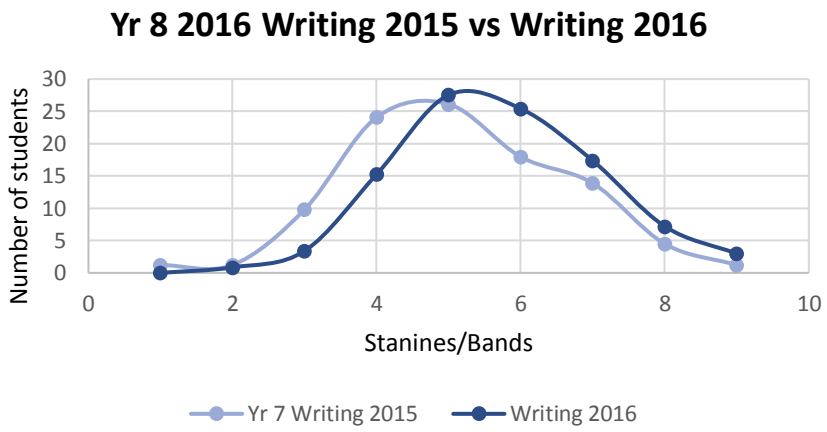


Figure 30: Allwell Reading Measurement

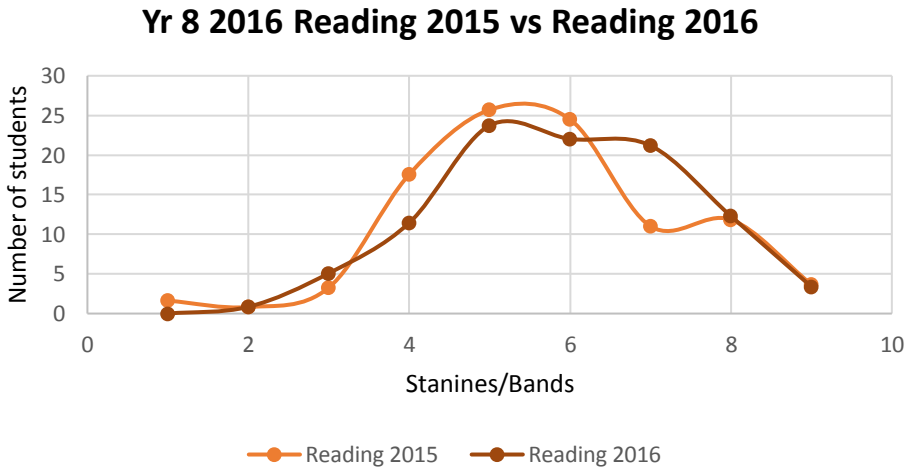


Figure 31: Allwell Maths Measurement

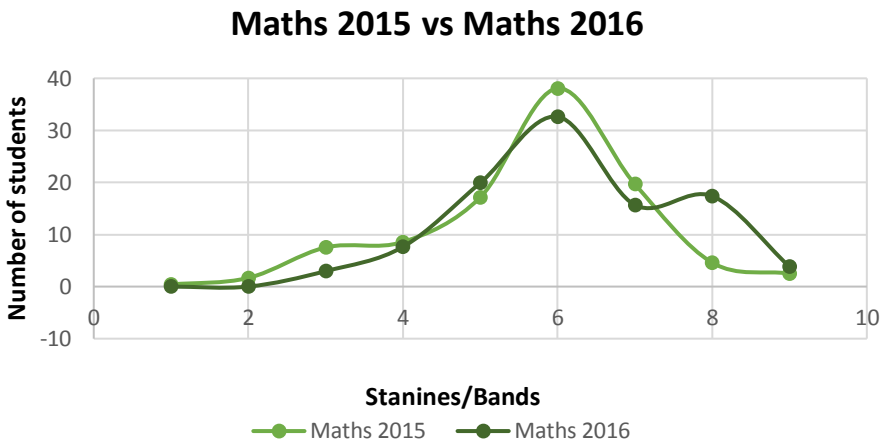
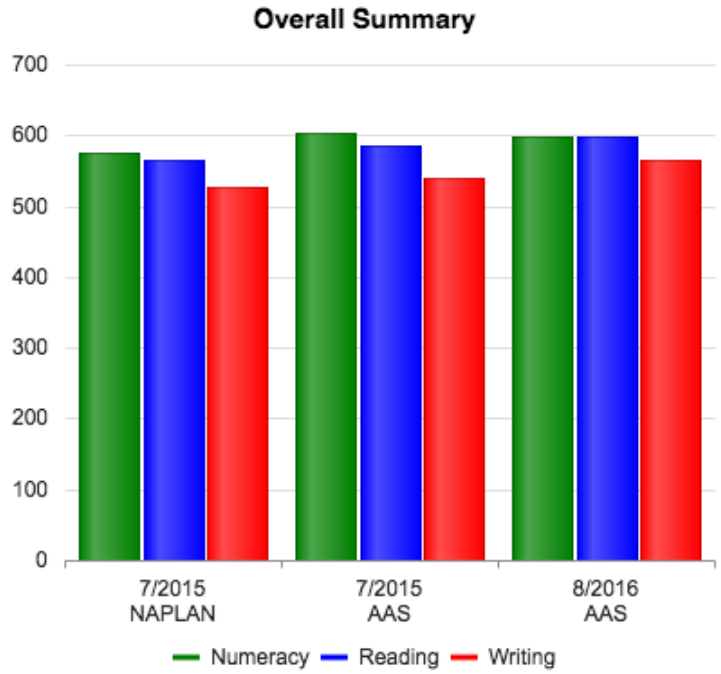


Figure 32: Overall Summary



All figures demonstrate growth except for *Figure 31,* which demonstrates a drop in numeracy levels. There can be a reasonable connection between the impact of transparency and a shift towards student-centred pedagogy and these results. While reading and particularly writing have improved across the cohort, writing from 580 points on the Academic Assessment Services National Progress Index to 620, numeracy has decreased by 39 points. Looking at the findings in relation to faculty overall rankings in the domains measured during lesson observations, subjects with a strong reading and writing base rank

highly, in particular, English (11/12), Geography (12/12), whilst Maths is ranked second lowest.

Maths also ranks in the bottom three faculties across all three measured domains in the Quality Teaching Framework analysis of assessment tasks covered earlier in the findings. The average score from 0-5 in the analysis of Maths assessment tasks for intellectual quality was at 1.9, while English for the same domain was 4.3. On all measures of the declared and taught curriculum, the Maths department demonstrates as not being supportive of the transparent declared online curriculum and not supportive of a move towards more student-centred pedagogy.

Figure 34: Year 7 Growth

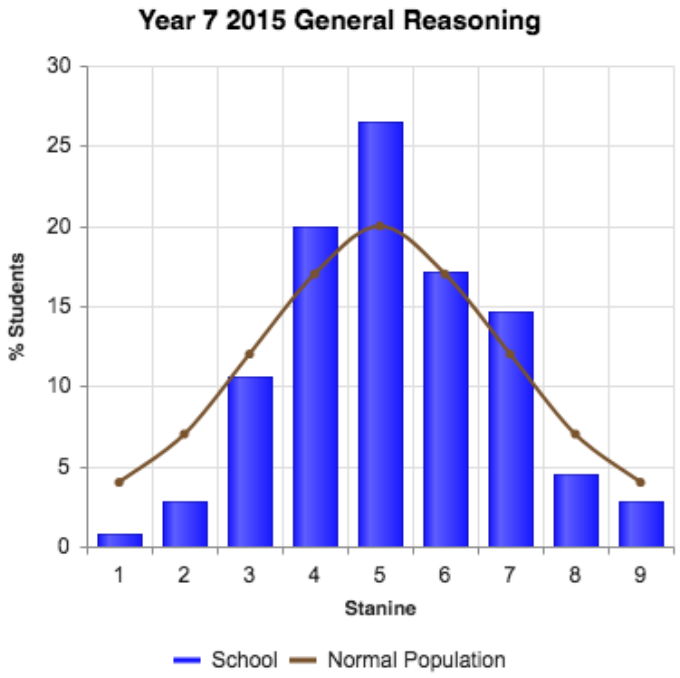


Figure 35: Year 8 Growth

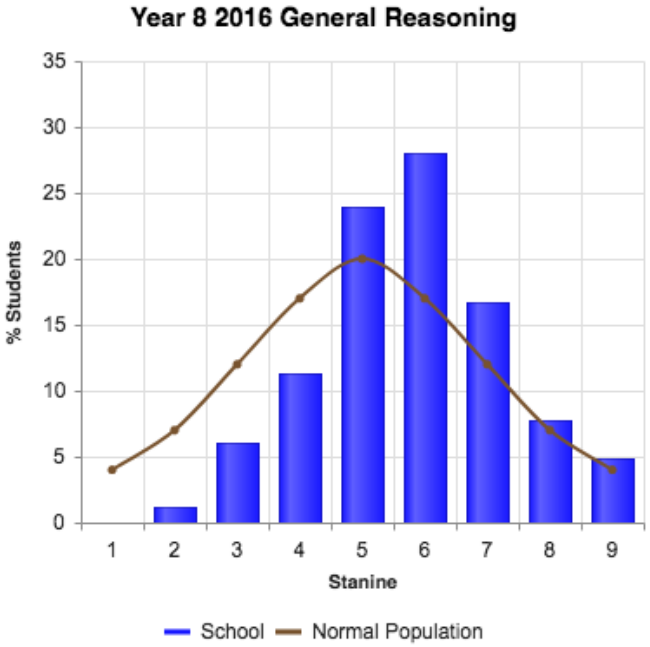


Figure 34 and *Figure 35* demonstrate growth in general reasoning demonstrated as a part of the Allwell tests. The pattern of growth is similar to the findings of the analysis of the California Critical Thinking Skills Test. The movement of students from the bottom three stanines into the top three stanines reflects the emphasis of deep thought and problem solving from the changes made to the declared and taught curriculums. In Year 7 there were 35 students placed in the bottom three stanines and 54 students in the top three stanines. This has shifted positively in Year 8, with only 16 students in stanine 2 and 3 (no student is in stanine 1), 69 students are now in the top three stanines.

Does this transparency and student-centred pedagogy support a stronger correlation between the declared, taught and learned curriculum for students?

To most effectively demonstrate the findings of the influence of transparency and student-centred pedagogy on the alignment of the declared, taught and learned curriculums, this section will focus on the trend graphs created from the 395 lesson observations during data collection.

Figure 36: Ten domains captured by Lesson Observer

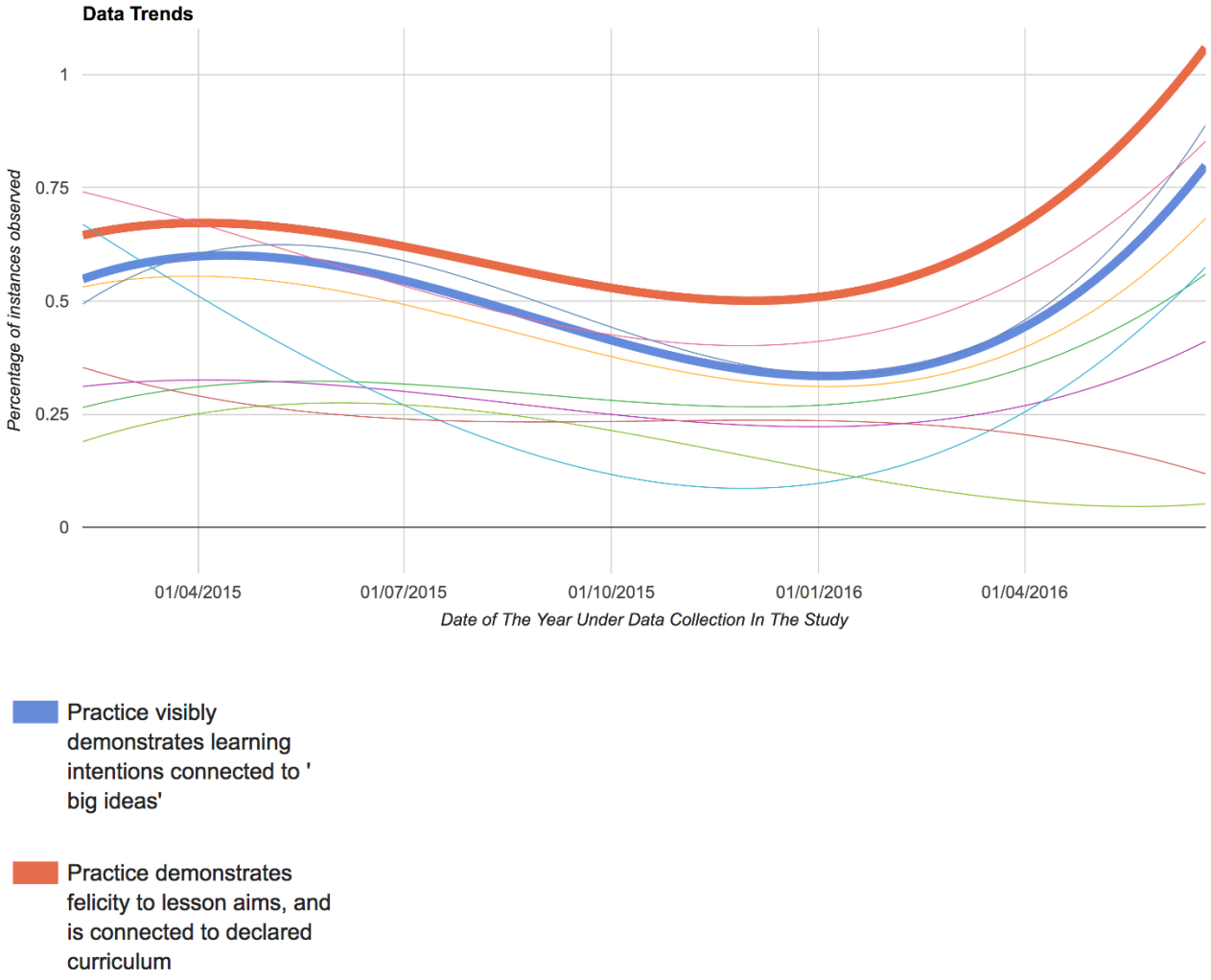


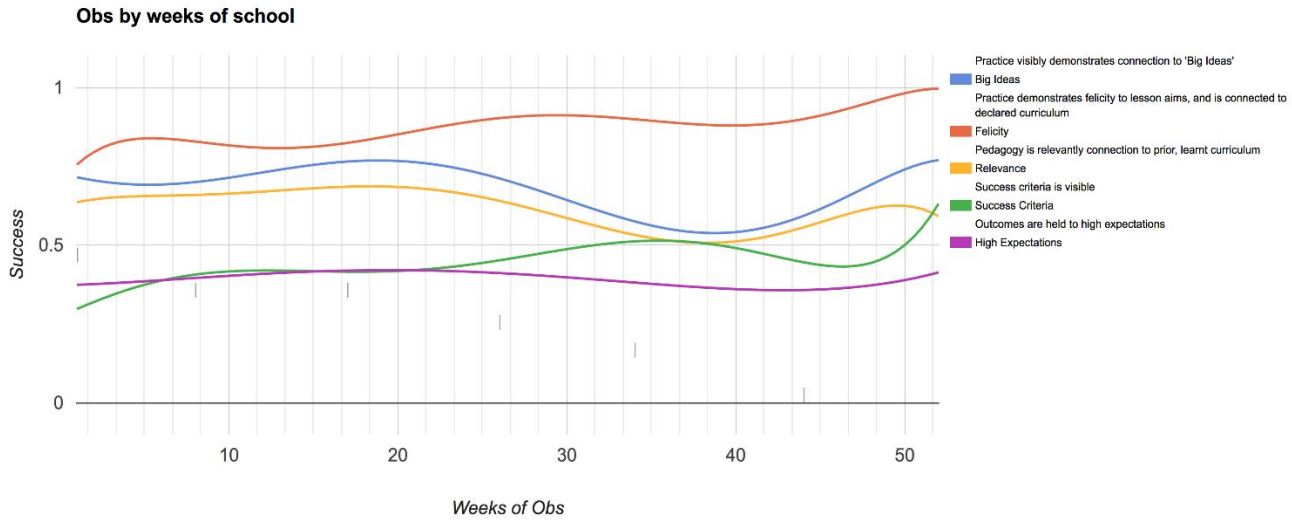
Figure 36 demonstrates the ten domains of the REAL Program enacted in the taught curriculum captured by the lesson observer.

- Visibly demonstrated learning intentions connected to 'big ideas'
- Demonstrated felicity to lesson aims connected to the declared curriculum
- Demonstrated relevance and connection to prior learned curriculum
- Visibly demonstrated a success criteria
- Outcomes are held to high expectations
- Options for student choice available
- Evidence of feedback on a scale of none - extensive
- Evidence of teacher collaboration
- Evidence of transfer or cross-curricular connection
- Demonstrates connection to assessment

This graph represents the percentage of lesson observations that connected to the ten domains over the six terms of lesson observations. The thick orange line represents the connection to the declared curriculum, which appears as one of the most effectively applied measures of the REAL Program. The thick blue line represents the connection to the learned curriculum through assessment, which again appears as one of the measures of the REAL Program more often applied in the taught curriculum. The most successful faculty in terms of holding a connection to their declared curriculum was English with a rate of 96.5% across 57 samples.

This is an important statistic, as the English faculty is large, and in the senior years of schooling can have as many as 12 different classes in the one course.

Figure 37: Trends from Lesson Observations



Consistency is a concern for students, parents and staff and appears linked to the transparent nature of the REAL program as people now have the ability to identify inconsistencies in the visible learning environment and support their concerns through the transparency of the program. Parents often hear comments about teachers and learning from their students and in the experience of the focus groups, appear to use this source with some reservation, understanding the nature of recounted stories. Parents can very clearly see deviations from the declared curriculum and inconsistencies in this area and raise concerns about this, going so far as to say that “some teachers are upfront and say,’ we don’t do this’.” Coupled with examples of assessment marks with an “80% variation

between classes", they want to understand how this is fair or just. Staff also note that they are not surprised "there are a lot of inconsistencies within and between departments."

Consistency in the declared curriculum is evident in the layout of the REAL Program website, in the documentation that reflects the teaching program and assessment tasks. There is also a level of consistency demanded by the various school structures that support curriculum. All subject areas must:

- use the REAL Program templates for programs, learning scope and sequences and assessments
- upload their faculty documentation to the shared Curriculum Folder structure so that it is visible to their colleagues across the school for planning
- embed their learning scope and sequence and assessment task/notification before students begin each term

The public nature of the website has supported a level of compliance for faculties as they are held to account by students, staff and parents when documentation is not compliant. This level of compliance is one measure of alignment, as now all assessment tasks are standardised (Appendix ix), using the Quality Teaching Project domains and are declared, clearly linking to the learning sequence. Previously, class teachers could create any task, using any standard and provide a mark in the obscurity of the staff room.

Discussion

In education today there is tension between what is widely understood in the community as the 21st Century learning imperatives: collaboration, creativity, critical thinking and communication, and the formally recognised academic measurements of NAPLAN and the Higher School Certificate. Where does a school legitimately place its focus to most effectively support its students? Should schools, in the words of John Hattie, "appease the parents" (Hattie, 2005, p.7) by continuing to meet their expectations, a situation often equivalent to teaching for the test?

Oakhill College was a school that in many ways was behind current thinking in teaching and learning practice. There was also a consistent lack of improvement in students' results in external tests. The REAL Program was created strategically as an interim structure to address these issues. It was created as a platform for propulsion into more progressive learning initiatives, such as project-based learning, for breaking down traditional timetable structures, and for creating connections between students' learning and the real world.

The REAL Program's core aim was to do as its acronym declared, create an environment of relevant, engaging and active learning to develop students' critical thinking skills and self-regulation. It intentionally had the secondary benefit of putting programs, assessments, pedagogy and many other curriculum matters under a public spotlight through its deliberate insistence on transparency. This transparency was necessary to identify what was preventing improvement in student outcomes. However, Hattie's 'Visible Learning' practices of learning intentions, success criteria, and high expectations, coupled with transparent declaration of the curriculum were merely a start. Part of the transparency philosophy was to literally open doors through class observations and team teaching. At the end of the pilot year, the AISNSW research project was developed to measure and support staff through the confrontation of this new period of change. The discussion of findings in relation to the rest of the report will be broken into three sections: (1) whole school implications (2) implications for teachers, and (3) implications for students.

Transparency, as defined by the National Institute for Learning Outcomes Assessment University of Illinois, "is making meaningful and understandable information about student learning available to internal and external audiences" (NILOA 2014). This process, coupled

with the shift to more student-centred pedagogy as outlined by Mayer (2004) and Mascolo (2009), has had an impact on student learning at Oakhill College. The findings indicated earlier in this report is evidence of the impact of the REAL Program on the declared, taught and learned curriculums (Harden, 2001, p.124). The challenges that the transparency in particular has placed on the school as a whole have been immense. The very culture of Oakhill has been tested, examined and deconstructed by all stakeholders with long lasting ramifications. The teaching programs, resources and practices of each faculty have been publicly available through the REAL Program Website (since re-titled Learning@Oakhill), and this has indicated a need for further fundamental changes to structures around accountability, leadership, and employment.

As revealed in the focus groups, students and parents are no longer willing to accept not being able to 'see' what students are learning. This means that former practices of re-hashing old programs, a 'near-enough is good enough' attitude to curriculum design and roughly prepared assessments, is becoming a convention of the past. Students and parents expect to be involved in the learning process, being able to see where they are going, how they will get there and how they will know they have arrived (Hattie, 2012, p.22). Not only has the transparent declaration of the curriculum online led to higher expectations for learning, but the principles of 'visible learning' promoted in the work of Hattie (2009) have provided an effective scaffold of learning intentions and success criteria to support the transparency for learners and teachers alike. Instead of assuming the declared curriculum is what is being learned, transparency through the website acts like Harden's curriculum mapping ideals, "making explicit what it is that the students should learn" (Harden, 2001, p.124).

Coupled with the evidence of classroom observations, there is no longer the need to have the faith that there is coherence between what is supposed to be taught, what is actually taught and what is assessed as nominated by Hirsch (1996, p.126).

Parents have progressively become more aware of REAL since the pilot year but now the greater task is to support parent engagement and understanding through workshops and continued transparency about the pedagogy and its origins. There are some parents who find difficulty due to their lack of IT capacity, and this will continue to be an area where the

program challenges parents who “don’t know what’s going on with the work” and are “struggling with the IT.”

The Quality Teaching Framework aligns closely with the research base of the project and was introduced at Oakhill in 2009. *Quality teaching in NSW public schools: A discussion paper* (2003) was not a part of the literature review of this project as it is an embedded supporting document in many NSW schools and did not particularly inform the project. Interestingly for this study, however, the original discussion paper suggests that the “core business of the profession of teaching is pedagogy” (DET, 2003, p.4) and that “the model is available for use by schools and teachers to focus discussion and critical reflection on the teaching and assessment practices that take place in classrooms” (DET, 2003, p.4). As outlined in the findings section, the QTF assessment analysis demonstrated that the faculties of Geography, English and Science, led the charge to more intellectually rigorous, engaging and significant learning opportunities. The growth demonstrated across all three of the QTF domains (intellectual quality, learning environment and significance) reflects the trajectory of improvement for learning at the College. Embedding the improvement across all faculties and all year levels will be the next phase of improvement needed to build the desired consistency mentioned in focus groups, particularly by parents. Along with the consistency will come more opportunities for transference as well as curriculum alignment. The drive to close the gaps between the declared, taught and learned curriculums has lifted expectations in several sectors of the school, namely programming and assessment quality (in line with the Quality Teaching Framework) and will impact on increasingly more school structures as the changes take deeper root in the cultural landscape of the College.

One of the most significant elements that challenge traditional practice is the documented perception of a rigid structure with little autonomy for staff. Despite numerous small group and whole staff interventions to explore the pedagogy, these high-level resistors continue to shun the program in favour of their own traditional classroom practice. As one parent stated in a focus group “Some teachers still do their own thing and do not follow it.**”** When they are encouraged to participate in collaborative learning, particularly during the formal interventions supporting the research project design, they withdraw or remain silent, thus abdicating their opportunity for a voice in programming and assessment. Yet, when questions were asked about the unique challenges of REAL, even in the final phase of the

focus groups, these staff still mentioned the prescriptive nature of the learning sequences. In other words, despite choosing not to collaborate, they complain about the results of the collaboration of those staff who have embraced the REAL Program, a complex, ongoing, and problematic circumstance.

Additionally, technology is a barrier for some people; the other key indicator of high-level resistance being an inability of teachers to appreciate the role of technology in the classroom, since “Laptops are distractions”. Again, there are multiple elements to this restriction, low skill level, fear of failure, “there is no manual or book to explain what is right or the wrong way to go about things”, an unwillingness to commit time to professional learning, and a perceived threat to classroom management. One teacher in the Phase 2 focus groups described other teachers as, “not wanting to use the program because they feel that it is not engaging the students, looking at laptops. If students are looking at laptops, the teacher feels they are not doing their job.”

An interesting phenomenon that occupied much discussion from the project members was the principle that, through structure, a system can provide opportunity for freedom, an unusual but persistent paradox of the findings. The transparently declared curriculum of the REAL Program is highly structured, with many faculties providing scope and sequences in lesson by lesson detail. This system has challenged all staff in the learning design and their classroom practice, but undoubtedly has led to improved practice, and arguably far more dynamic practice; the invitation to formally declare and codify units of work in very public ways encouraging creativity, quality and small sense of enterprise. The classroom observation data set identified that 87.73% of teachers adhered to the structured declared online curriculum provided. Undoubtedly, the effect of the research observer in the classroom had an impact on this level of consistency. However, a continued culture of transparency within Oakhill provided by the learning website, the expectations of stakeholders and the accountability of instructional rounds (class observations as part of professional development, replacing research observations) should ensure the trend of openness and visibility grows. Students, teachers and parents will continue to expect and demand it:

> *Information on student learning can and should be presented in language that is understandable by specific and multiple audiences, widely available across the*

> *website, updated regularly, receptive to feedback, and accessible by multiple web browsers.* (NILOA 2014)

The consistency of teachers aligning the declared and taught curriculum has reinvigorated a large section of the teaching faculty and aligned more of the curriculum to the school's overall goals:

> *The key to an effective curriculum is to get teachers to exchange information about what is being taught and to coordinate this so that it reflects the overall goals of the school.* (Harden, 2001, p.135)

There has been a considerable problem with variance in the taught curriculum within faculties, leading to issues in the learned curriculum. In one case, the timing data revealed a particular teacher would lose 15 minutes at the start of every lesson due to non-learning based activities (for example: late to arrive, taking a lengthy amount of time to set up IT, and settling students), resulting in almost an hour lost each week. In this class the students' task completion rate was significantly lower than all other teachers in the faculty. This then reduced student achievement of learning outcomes, such as assessment task results. During the parent focus group for Phase 3, one parent stated, "There are inconsistencies in assessment wording and in the success/marking criteria". Another pointed out the concerning degree of variance in the assessment experience of their twins in a Religion assessment, where there was an "80% variation between classes". Staff also noted that they are not surprised, declaring that "there are a lot of inconsistencies within and between departments", and "if we as a staff are to be on board with the REAL program, we need to do more as a whole staff."

Variance has many contributing factors, most notably, a lack of collaboration. Before the REAL Program, there was little evidence of collaboration around learning, between teachers, amongst faculties, amongst interest areas within the College, between teachers and students, between the College and parents or the broader College community. Evidence from the lesson observations reflects low levels of collaboration between teachers reaching a high point of 28% midway through 2015 and bottoming out at 4% of lessons observed as the data collection ended.

Concerns around homework indicated by students, parents and staff, also connects to the lack of collaboration. Duplication of content, skills and outcomes continues to occur, though

with less frequency than it did before the REAL program, and with a continued downward trend forecast. This is demonstrated in Figure 13, where transference is the least applied of the 10 domains. What is most concerning about this domain is that it is evidence of another weakness in collaboration. Teachers appear to have no understanding or awareness of the programs of other faculties, despite the online declared curriculum.

Homework is another example of the need for development in collaboration and transference. There appears to be a need for a school policy or strategy in moving forward with new pedagogies and their disconnection or intersection with homework. Parents and students in focus groups noted traditional practices that use time at home to complete work that should be completed at school as a source of stress. In the Phase 3 focus group, teachers also noted the disconnect between old habits of setting homework without really stopping to consider why they do it, one teacher going so far as to say "it just seems like it's what people expect." In the Phase 3 survey, 65% of staff indicated they never collaborate with other staff regarding homework. It is not surprising then that there are many examples of crossovers in homework tasks, bulge periods of assessments and disconnected homework activities that could be considered as 'busy work'.

Thus, the paradox of structured freedom functions in its capacity to allow more time for refining programs and curating the most relevant resources when the, necessarily structured, centrally developed, and collaborative declared curriculum is visible to all. In the classroom with this in place, teachers accordingly have more time to spend with individual students now that the burden of teacher-centred instruction has been shifted to a concrete, highly visible, and easily accessible space. This time enables more opportunities for feedback, personalised learning and authentic differentiation. These are all the possibilities afforded to Oakhill teachers through a transparently declared online curriculum and a shift to more student-centred pedagogy. As the quotes from students, parents and staff in the findings outlined, there is still a significant way to go to ensure consistency, and in particular the support of all staff and all faculties. However, the support of most of the domains from the lesson observations provides evidence of a genuine, positive impact on classroom practice.

Expectations regarding IT services, timetabling, reporting and communication have lifted and will continue to drive improvement in the services provided by the College. It seems

long ago now that the College battled unsuitable ICT devices, under-serving networking and wi-fi, or clunky and poorly connected software solutions. The transparently declared curriculum, more student-centred pedagogy and subsequently altered teaching practice, necessitates a base level of structural support. More effective structures should force improvement to continue into the future. The interdependency of systems within a school environment has meant that a change to elements in one area of curriculum has had a ripple effect on the structures that support the system. The immediacy of the declared curriculum in the online environment means that the College may no longer sustain rigid reporting periods, and is able to provide more effective, immediate levels of information for students, parents and teachers.

Who are the students taught at Oakhill and who are the people employed to teach them? This is now a question at the forefront of whole school deliberation. What type of school is Oakhill? The critical conversations about these questions are now out in the open and are a part of the collegial discussion that is accelerating change. The transparency of the learning framework and atmosphere of visibility has brought the 'skeletons out of the closet', starting conversation around the central barriers to success, so much more visible that success and those barriers are. In the past, the College leadership may have suspected a level of non-compliance around College protocols for learning design, as was evidenced in the failure of UbD to take hold amongst departments. It would have been very difficult to make improvements to the quality of assessment tasks when they were not readily accessible for deconstruction, only appearing as a document for an individual class or a question in one teacher's head. Now that the assessment tasks can be seen, efforts can be made to develop their intellectual quality, the quality of their connection to the learning environment and significance.

The implications for teachers are far-reaching. Although not all teachers at Oakhill have taught in the REAL Program during the last 18 months, the atmosphere of transparency and shift in pedagogy has affected every teacher in the school, and all teachers have been involved in interventions provided by the research project. All teachers have had opportunities for professional learning on reflective practice, learning intentions, success criteria, high expectations, feedback, instructional rounds, quality assessment, high-order thinking and metacognitive strategies. All teachers have also gained time from the strategy

to reduce face-to-face teaching loads from 39.4 to 36 periods per cycle. All teachers have gained access to resources and 21st century tools from improvements to college infrastructure like the wi-fi, the BYODD rollout, the staff landing page and embedding of Google Apps for Education.

Teachers at Oakhill have been challenged to raise the bar of professional standards and expectation through the transparency and shift in pedagogy. Using Biggs' (2003) 'constructive alignment' and Britton et al's (2008) notion of understanding over content has altered the role of the classroom teacher, but for many teachers, the chosen tools by which the new pedagogies have been embedded in student learning have caused the most disruption. The expectations to engage with an ICT-rich learning environment has been difficult for some teachers and a percentage of these teachers have been openly hostile to the program, as indicated in the quotes used from the focus groups in the findings section.

An area that requires much greater attention and ongoing professional development is pedagogical understanding of teachers. Oakhill has been on a four-year journey of cultural shift to make learning the centre of its mission. This is challenging for many staff that had slipped into the mindset of leaving their professional learning at the gates of university or teacher training. There are several contributing factors to the miasma of apathy when it comes to reflection on professional practice. For instance, there is no current role description for teachers at the College or any other means of accountability to formalise professional learning. 24% of the staff have more than 20 years service at the College and up until the research project, had not experienced a culture of professional expectation around their own professional learning. The failure to supply a framework of professional learning has continued to underserve even recent graduates working at the College.

The most important finding in terms of the impact of the REAL Program on teachers has been around the role of teacher identity. The quantitative data sets collected during the study identified outliers in the teaching faculty. These teachers demonstrated gaps in skills like low ICT proficiency, limited pedagogical understanding, over-reliance on a few teaching strategies, consistent lost time in lessons, limited questioning skills, or poor skills in classroom management evident through higher-than-usual off-task behaviour documented during lesson observations. Some teachers presented with a combination of several, or even at times, all of the concerns identified in this report. However, there were occasions in the

formal research environment of the staff focus groups across the three phases of data collection and in the informal discussions with the lesson observers that these same staff challenged the research behind the REAL Program or the program's structure and methodology. These teachers seemed to believe that they were highly proficient teachers and that the addition of a transparent declaration of the curriculum online and the shift to more student-centred pedagogy was a threat to their level of proficiency. In notes taken by the researcher during research team meetings, there were examples of conversations team members had with individuals from the resistant section of staff. These conversations focused on the perceived impact of REAL on the needs of the teacher and the identity they had constructed. If a teacher's identity was reliant on a need to talk at the front of the classroom, the 'storyteller', then the effects of the REAL Program were unsupportable. If a teacher's identity was aligned to traditional tools of practice, and was not in favour of digital tools, the heavy ICT focus was a deterrent. Those teachers who had difficulty with ICT also identified technology as a barrier between himself/herself and the student, and so those teachers who preferred pastoral interaction felt increasing isolation. Teachers, who were heavily reliant on control for classroom management and not engagement as a measure of success, also found the openness and self-reliance encouraged in REAL classroom practice to be a threat.

The research team underestimated the significance of teacher identity within the program. Despite the provision of more time, more professional learning, more resourcing and more opportunities for support of teaching staff through mentoring and collaborative practice, it seems some teachers would never be supportive of the changes advocated for curriculum, alignment, visible learning or any of the 'new pedagogies' (Fullan and Langworthy, 2014). Teacher identity, for a percentage of staff, was fixed and aligned to values that were not at the heart of the vision for learning offered by the REAL program. This fixed mindset is a possible area for exploration in future studies. What is clear from the findings outlined earlier in the report and the experience of the research team during the project, is that intra-school variance of teachers in their application of the declared curriculum as discussed by Hattie (2015, p.15) is not only possible but highly likely given the impact teacher identity has on what happens in the classroom.

Visible Learning asks educators to see learning through the eyes of the learner (Hattie, 2009). Only by making this shift, can the pedagogical move towards more student-centred classrooms occur. The research team has struggled to promote more innovative and experimental possibilities like vertical learning, flexible learning, and learning beyond the classroom by connecting to community partnerships, due to the inability of some staff to use the lens of the learner. It would be the aim of future planning in learning design that student choice figure more prominently in class work as well as assessment, so that there would be more consistent opportunities for student voice and choice after the interest identified by students in all three phases of focus groups. However, this choice must find a complex relationship to developments in curriculum alignment already made. Student choice was also a poorly applied domain, as noted in the lesson observations. With evidence of growth in critical thinking, general reasoning and writing that subverts the previous seven years of negative growth at the College in writing in particular, (the only exception is in 2015 Allwell data for the current Year 9 cohort who are the pilot cohort of the REAL Program), this study may be the catalyst for the sceptics to open themselves to change.

One of the most interesting and potentially concerning findings of the study in terms of teacher practice, is that the evidence provided through tracking the trends of application of the 10 domains identified in the lesson observations, highlighted a pattern that implies a progressive slide in fundamental teaching standards over the cycle of a school year. The steepest gradient of the decline in application of the domains of teacher practice observed in lessons took place from early Term 3 and continued in decline until it lifted at the start of the following school year. This decline occurs as Year 12 is preparing for Trial Higher School Certificate examinations, which understandably would have an impact on Year 12 classes. However, the observational data of this study was collected in Year 7 and 8 classrooms, so why would examinations in Year 12, impact on Year 7 and 8 classrooms? Of course it is easy to identify the impact of exam preparation, extra feedback, then setting and marking of examination papers on a teacher's capacity to do their job. Can it be deemed appropriate however, that the classroom practice of teachers is in steady decline throughout the year, in year groups that have nothing to do with the Higher School Certificate? Should teachers who are teaching senior courses, only teach senior classes? Will the need to spend inordinate amounts of time on preparing HSC students diminish at Oakhill when the first

cohort of students who have come through the REAL Program, as owners and co-constructors of their learning, are in Year 12?

In terms of implications for students, the findings already outlined, while not conclusive, do present reasonably solid indications of a connection between transparency and a shift in pedagogy, and effects on student learning. The online declaration of curriculum has prompted improvements in the quality of programs, particularly in terms of intellectual quality around higher-order thinking. The promotion of higher-order thinking is also identified in the data set that tracked the use of questioning strategies in lessons. This focus, in turn, can be linked to growth in critical thinking skills indicated by the results of the California Critical Thinking Skills Test outlined in the findings. A similar pattern of growth was also evident in the results of general reasoning in the Allwell tests.

By making students active participants in their own learning as supported by Dochy et al (2002) in Baeten et al (2010), through the transparently declared curriculum and visible learning methodology evidenced in classrooms through the lesson observations, students in the study cohort demonstrated a pattern of growth in most academic measures unlike previous non-REAL Program cohorts. 59% of the study cohort has demonstrated growth in average marks from Semester 1, 2015 to Semester 2, 2016. After seven years of successive negative growth in writing through the measure of standardised tests, particularly NAPLAN, the study cohort has demonstrated growth as indicated in the results of Allwell testing in this identified area of weakness for Oakhill College students. The growth in writing comes after a concerted focus on thinking and writing in subjects including English and Geography, who rank Best (11 and 12 respectively) respectively in the overall faculty rankings by application of REAL Program domains across lesson observations, Quality Teaching Framework assessment analysis, teacher survey, measurement of off task behaviour, tracking of questioning strategies and lesson timing data. Due to the high level of transparency offered by the declared curriculum and ICT tools used by students, the amount of writing by students can be seen, can be compared, tracked and offered regular feedback. Furthermore, the need to host work online invariably requires something tangible - very often student written response - and it is undoubtable that the REAL Program has also simply amplified the number of writing opportunities that are both available to students, and for which students are accountable.

While faculties that have scored highly across the subject rankings can be linked to the growth in writing, a contrasting pattern of under-performance in numeracy could be linked to the ranking of the Maths faculty which is second lowest overall. It appears more than coincidental, that while faculties who have supported the change in pedagogy and curriculum alignment have seen growth in student learning connected to their faculty outcomes; a faculty that does not support the shift in pedagogy and curriculum alignment would see a decline in student learning outcomes.

Finally, the impact of a transparently declared curriculum, a shift towards more student-centred pedagogy, and greater curriculum alignment support a continued high level of student self-efficacy despite the transition from primary school to high school. The results of the student survey demonstrate a small decline in emotional engagement of students but this decline could be linked to the transition from primary school to high school and the many variables connected to this disruption. The data from the student surveys identified similar patterns to the student focus groups. The survey and focus groups presented students who were positive about learning, who wanted deeper and more relevant learning experiences that allowed for active and hands-on interaction over passive consumption of knowledge. The qualitative data reflected the findings of Fullan and Langworthy (2014) and the 'new pedagogies', identifying students who wanted to co-construct their learning, in a collaborative environment that supported them individually, using technology to connect with the outside world.

Students who have been a part of the REAL Program want to get on with learning, want to create and not consume, and clearly have a low tolerance for distraction to learning, be it from non-compliant students or 'waffling' teachers. Hattie and Timperley (p.87, 2007) promotes the need for students to know where they are going, how they are going and where to next, and the focus group data from this study supports this understanding.

Possible limitations of the study:

This study has several areas of limitation; the most significant is the lack of a control group for comparison. Without a comparable control cohort to measure against, it is difficult to demonstrate with certainty, the effects of the REAL Program, particularly the elements of a transparently declared curriculum and shift towards student-centred pedagogy. By being

able to compare against a cohort not experiencing a transparently declared curriculum or shift toward more student-centred pedagogy there may be a clearer line of correlation between the cause and effect on student outcomes.

It was not possible to accurately create equivalent measures in the only junior cohort at Oakhill who have not been exposed to the REAL Program; although these students are not directly affected by the program, there would be potential for teachers and faculties 'bleeding' REAL Program pedagogy and practice into other cohorts. There is also a two year age gap in the next 'non-REAL' cohort, which would add a series of other variables including their completion of a completely different stage of the curriculum and a series of behavioural and engagement considerations due to their stage of adolescence.

Another limitation of the study is the size of the samples in the lesson observations. While 395 lesson observations in one school is a more than reasonable valid data sample, the variation in sample sizes of the faculties within the study makes it difficult to weight the findings of all rankings equally. While the core subjects of English, Maths, Science and HSIE had significant numbers of observations, smaller faculties like Music had significantly less observations to measure. The impact of individual teachers on a small sample size may have the capacity to skew some results.

Taking the effect of an individual teacher into account may also have an impact in terms of their ability to support or resist elements of the program. A rogue teacher who chooses not to follow the declared curriculum and alter resources and pedagogy could be detrimental to rankings, despite a core of supportive teachers.

Implications:

The theoretical and practical implications of this study are far reaching and more than likely controversial in the eyes of many educational voices. By taking what is declared to be taught out of the obscurity of staff rooms, and making it transparent to all stakeholders and then making classrooms visible and open to observation, the assumptions about the declared curriculum can be minimised and the gaps in curriculum alignment can be narrowed as evidenced in the findings of this report. These ideas directly challenge teacher autonomy and thus teacher identity. This study suggests that the voice of each teacher is more

valuable at the point of learning design by collaborating before the curriculum is declared, and then again by having direct communication with each individual student in the co-construction of learning and the creation of an authentic feedback loop within the classroom. Traditional notions around the value of a teacher standing in front of the class the font of all knowledge; have been challenged by Hattie (2009), Fullan and Langworthy (2014), and a host of contemporary educational experts. This study would support the need for teachers to re-evaluate their greatest opportunity for effect on student learning.

Maximising teacher effect through transparency and a more student-centred pedagogy takes more time and more money. Time for teachers to collaborate; time for schools to research, collect data, analyse, implement and evaluate curriculum and the structures that support curriculum. These practices come at a cost. Time for collaboration is an expensive commodity. Using staff to monitor whole school practices, to support classroom teachers, to mentor, to curate and lead professional learning requires substantial funding. Perhaps many schools would not think this is a priority, however this study would advocate for the value in this investment over many piece-meal approaches to school improvement.

The approach to school improvement presented in this report highlights the value of change strategies developed in context, rather than externally constructed and then employed in schools. Harris, Zhao and Jones (2015) in Strauss (2015) warn against “grasping individual improvement strategies or approaches from other systems”. In the same article, David Hopkins (2013) argues against “the one size fits all” approach to educational reform. The choices to disrupt traditional structures and practices at Oakhill College through transparency have been confronting and not the same as other school improvement solutions, but were considered by the research team as the most effective way to ‘jolt’ the teaching staff into a contemporary learning paradigm.

Recommendations and directions for future research:

Based on the research and findings of this report, suggestions for further study would include continued tracking of the study cohort to identify further development with sustained time in the REAL Program.

The research team are currently building from the student and teacher data collected during this project to build an instrument that will measure and predict teacher effectiveness and student growth. This process will include the addition of student data from all current and ensuing students at the College as well as all teachers.

Of more value to the broader educational community would be a more sustained study into the alignment of curriculum and the impact of alignment on teacher effect and student learning. Finally, valuable understanding would be gained from a study around the impact of teacher identity on student learning outcomes. How much does the way a teacher sees himself/herself, impact on their effectiveness in the classroom?

Conclusion

The impact of the REAL Program on Oakhill College is undeniable. If nothing else has stemmed from the program, the focus on learning and improvements to teacher practice has changed teaching and learning at the College for the foreseeable future. Transparency has allowed all stakeholders to 'see' where improvements need to be made in moving forward, to provide the best outcomes for the students of the College.

The students of the study cohort, and in fact all students who have been a part of the REAL Program since 2014, would find it difficult to go back to the former teaching and learning paradigm offered at Oakhill, where students were talked at in rows for extended periods of time about concepts that were only shared with them at the point of need. Assessment tasks were provided with two weeks notice and were therefore rarely overtly linked to classroom learning. Students were in the dark as to where they were going, how they would get there and how they would know they had been successful in their learning. Parents too, were communicated with individually by classroom teachers and had little knowledge of the overall goals for learning for their sons. Lessons were content heavy and rarely connected and there were frequent double-ups of assessments and subject material across the year, with no coherence in the curriculum between faculties. Incidents of student anxiety were commonplace and parent complaints about the burden of homework and assessment clashes were frequent. Regurgitating facts was central to learning outcomes and higher-order thinking was rarely called for and poor practices were evident.

Teachers too would find the former practices limiting and inefficient, not to mention completely at odds with the changing nature of students presenting from primary school. Failure to move to more contemporary practice would also broaden the disconnect between expectations for life outside of the College and the careers the students will need to prepare for after school. On the cusp of the greatest change to the teaching profession seen in this country for many years, with the adoption of national accreditation for all teachers using the AITSL standards, very few pre-2005 teachers would be able to successfully navigate the management of their proficiency without the framework and practices embedded through the REAL Program and its expectations around transparency and student-centred pedagogy.

Research to Practice Impact

The opportunity to study the intricacies of the REAL program in application has and will continue to provide the research team and College leadership, accurate quantitative and qualitative data to inform the Oakhill Learning Framework, to guide policy around teacher practice, technology and various levels of infrastructure within the school. Future projects like the College Master Plan will also be informed by the findings of this report. The program and research project have modelled transparency in the research as well as vision for learning at Oakhill College. Therefore, the findings of this report will be an important source of reference for critical conversations in moving forward at the College and the journey of cultural change.

The school improvement agenda sustained by the REAL Program has uncovered poor work practices and inefficient structures and systems, placing them under the microscope for examination. The data driven environment promoted by this study has been a most effective way to challenge cultural issues holding back teacher practice and ultimately, student learning. With a framework of research, data collection, analysis, application and evaluation modelled through this action research study, the possibilities for school improvement appear to be limitless. Action research and teacher as researcher are now a powerful model for change.

The teachers involved directly as researchers have become acutely aware of the need for data-driven school improvement. Each member of the research team has gained not only valuable insight into the effect of research within education but also invaluable skill-sets in research, data analysis, learning design, curriculum and a host of educational research theory.

The research agenda has spread to the broader teaching staff, modelled by the College leadership. There are now academic readings supporting transparency, curriculum alignment, visible learning and student-centred pedagogy posted as a part of professional learning expectations and teaching and non-teaching staff regularly meet to discuss posted research content.

All sectors of the school are using data to promote improvement. In particular, the prevalence of individual student data as a starting point for intervention by staff is a lasting influence of the research project and its practices.

It is the plan of the research team to continue to track the student cohort of the project and the project lead is currently investigating further funding to support this. The College has indicated a willingness to support the role of a research assistant to continue lesson observations in some form. Allwell testing will continue as a measure for tracking students reasoning, literacy and numeracy across all cohorts from orientation to Year 11. Using the considerable student and teacher data collected to date and the plan for the addition of more cohorts to the collated results, the research team is currently constructing a platform to measure and eventually predict teacher effect and student growth using the domains observed in this study.

Using the encouraging evidence of student learning growth from the project, the research team hopes to implement more progressive steps to enable personalised learning approaches for students which include moving out of horizontal academic structures and acceleration for students at their completion of outcomes, not the completion of a school year. This could include connection to tertiary institutions for early credit and entry to university courses.

It is the hope for this study that other schools will observe the findings on student outcomes and be encouraged to transparently declare the curriculum and aim for greater alignment of the declared, taught and learned curriculums. The research team propose to present the findings at various educational conferences throughout 2017 to promote the value of a transparent declared curriculum and shift toward more student-centred pedagogy.

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