QUEENWOOD

Per aspera ad astra

Smart Study

SMART STUDY
REPORT 2024

Queenwood acknowledges the Cammeraigal people who are the traditional custodians of the land on which the School is built and we pay respect to Elders past, present and emerging.

Contents

Executive Summary

This report evaluates the Smart Study program, a self-regulated learning initiative at Queenwood, an independent girls' school, focusing on Years 9 and 10. The program aimed to teach explicit self-regulation strategies to reduce academic stress, enhance student wellbeing, and address learned helplessness. Rooted in Self-Determination Theory, the program emphasised fostering student autonomy and competence to align academic abilities with expectations.

Key findings

1. STUDY ENGAGEMENT: Significant improvements were seen in school participation, planning, and persistence, which were sustained over time. These outcomes demonstrate the effectiveness of the program in fostering long-term student engagement with their learning.

2. BASIC PSYCHOLOGICAL NEEDS: Substantial increases in competence and autonomy satisfaction were observed, particularly in the early terms, reinforcing the critical role of self-regulated learning in promoting wellbeing. These improvements are known predictors of academic success and emotional resilience.

3. STUDY ANXIETY: While a slight decrease in study anxiety was recorded, these reductions were less sustained over time. This suggests that while the program addressed immediate concerns, more targeted interventions may be required for long-term anxiety management.

4. TEACHER IMPACT: Teacher focus groups reported increased confidence in delivering explicit instruction in study skills, with noted shifts in students' engagement and application of strategies across subjects. Techniques like retrieval grids and brain dumps became embedded in classroom practices, highlighting the program's broader influence on pedagogy.

Implications for practice

The Smart Study program demonstrated that self-regulated learning can be explicitly taught and ultimately integrated into teaching. However, to ensure sustainability, the following recommendations are made:

- **Curriculum Integration:** Study skills should be embedded into subject-specific content rather than treated as standalone skills. This ensures that students can apply strategies in meaningful contexts, enhancing their relevance and retention.

- **Teacher Professional Development:** Many teachers lack training in study skills and self-regulated learning strategies. Investing in professional development will help bridge the gap between research and classroom practice, empowering teachers to consistently reinforce these strategies.

- **Sustaining the Program:** To maintain the momentum beyond the initial implementation, schools should use change management frameworks, such as ADKAR, and develop a multi-faculty team to ensure the program's continued priority. Succession planning for leadership roles is also essential to long-term success.

In conclusion, the Smart Study program offers valuable insights into the benefits of explicit instruction in self-regulated learning. It provides a framework for improving student engagement and wellbeing that can be adapted for other schools. ●
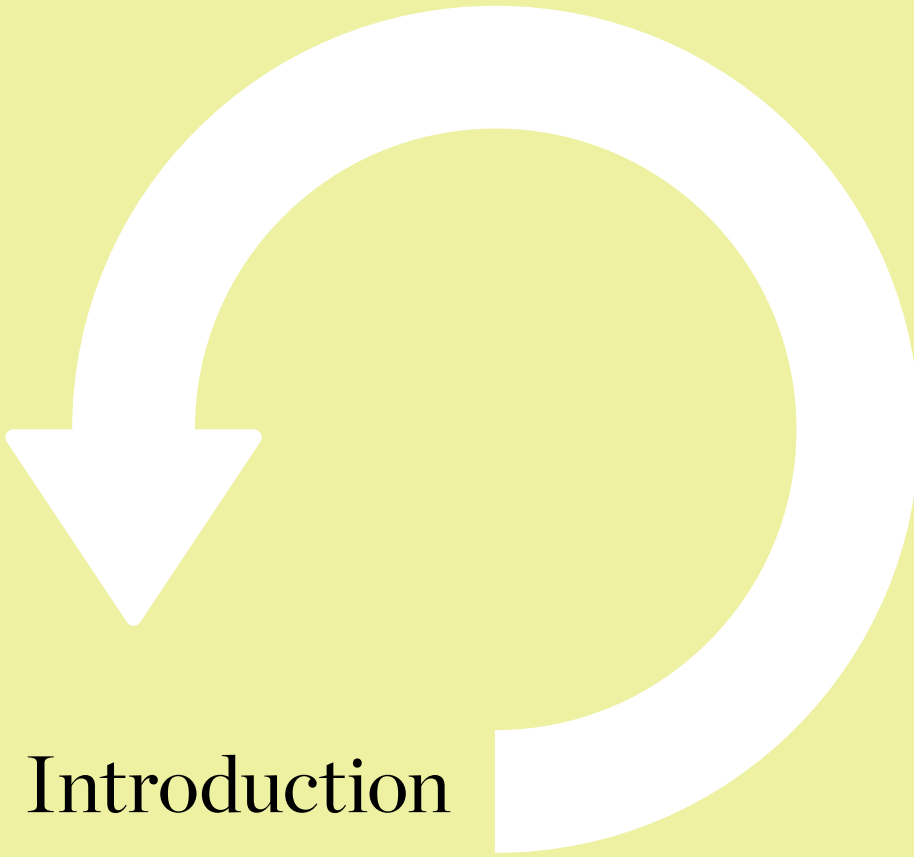
Introduction

Self-regulated learning is receiving increasing attention in Australian education. At the same time, student academic stress is rising (ReachOut, 2021). The popularisation of Hattie's (2010) meta-analytic research influenced Australian education discourse and curriculum, and the findings showed self-regulated learning to be among the largest influences on student learning (metacognitive strategies d = .69; study skills d = .59). Like the Melbourne Declaration before it (Ministerial Council on Education, Employment, Training and Youth Affairs, 2008), the Mparntwe Declaration emphasises the importance of developing "successful lifelong learners" who:

develop their ability and motivation to learn and play an active role in their own learning, ...are responsive and adaptive to new ways of thinking and learning, [and] are able to plan activities independently (Department of Education, Skills and Employment, 2019, p. 7).

While the Australian Curriculum includes cross-curricular priorities that touch on these dispositions, skills, and strategies, they tend to be subsumed under broad and general capabilities (Australian Curriculum, Assessment and Reporting Authority [ACARA], 2023). Features of self-regulated learning are not listed as outcomes, but ill-defined practices, like the capacity to "think about thinking," or "reflect on processes" (ACARA, 2023). Similarly, "Personal and Social Capability" are combined, with the ability to "develop reflective practice," and "understand themselves as learners" listed as desirable outcomes. Dimensions and definitions are diverse, with somewhat nebulous labels given to associated educational movements, such as "learning to learn," "mindful learning," "autonomous learning," and "flow experiences'' that are captured by this construct (Paris & Paris, 2001, p. 91). Despite the importance of self-regulated learning in public policy, discourse, and research, little guidance is given to teachers, schools, and school systems on how to implement it.

This study aimed to address these issues by investigating the relationship between the explicit teaching of self-regulated learning strategies, namely study skills, and prerequisite indicators of student wellbeing. ●

Literature review

1.1 Self-regulated learning

Although the term self-regulated learning comprises a range of definitions and constructs, it is broadly understood as the ways that students initiate and sustain their thinking, behaviours, motivation, and emotions towards a goal (Schunk & Greene, 2017). Behaviours of self-regulated learners are directed toward a learning goal and are relevant to the task (Schunk & Greene, 2017). Self-regulated learners consistently plan, monitor their progress, and reflect on their learning in a cyclical feedback loop (Schunk & Greene, 2017). The term encompasses a range of practices as broad as self-checking, personal organisation, reflection, and study skills. The discrete area of study skills is clearly defined as "academic enablers" that support students in effectively and efficiently recording, organising, synthesising, and recalling information (Gettinger & Seibert, 2002, p. 350). These strategies are founded upon established cognitive science (Bjork & Bjork, 2011; Roediger, 1985) and are the focus of this project.

1.2 Study skills

Students continue to use arbitrary and ineffective study methods, but in a vacuum of instruction, teachers are paradoxically not to blame for these choices (Kornell & Bjork, 2007). Great strides have been made since the "cognitive revolution" in educational psychology (Paris & Paris, 2001), with rigorous research supporting the efficacy of particular strategies over others (Dunlosky et al., 2013; Kornell & Bjork, 2007). But many teachers do not know enough about these strategies to bring them to their students (Dunlosky et al., 2013). The Australian Education Research Organisation (2021) found that only 48% of surveyed teachers utilise research evidence in their practice, suggesting that a lack of explicit instruction in study skills reflects a broader research-practice gap. By bringing together explicit instruction, with the known links with self-determination theory, this study affirms a method of teaching self-regulated learning in an effective and need-satisfying way.

1.3 Self-regulated learning and wellbeing

Self-regulated learners are more likely to be able to adapt to the needs of a world that now demands life-long learning, to view the future with optimism (Zimmerman, 2002), and to experience a range of academic, social, and emotional benefits. There is a positive relationship between self-regulated learning and a range of indicators of wellbeing, creating a virtuous circle of self-regulatory processes, affirmation of performance through self-monitoring, and motivation (Zimmerman, 2002). Similarly, self-regulated learning can be likened to a coping strategy (Struthers et al., 2000), and self-regulated learning skills (or lack thereof) can give rise to positive (or negative) learning emotions (Putwain et al., 2013). Research has also found predictive links between metacognitive learning strategies, positive emotions and academic performance (Hayat et al., 2020), reinforcing self-regulated learning as an important capability for students.

1.4 The teaching of self-regulated learning

Increasingly, research suggests that these skills can be explicitly taught. However, self-regulated learning capabilities are "distressingly absent" for many students (Zimmerman, 2002, p. 70). Researchers of the aughts recognised the imperative for the teaching of self-regulated learning strategies (Boekaerts & Cascallar, 2006; Paris & Paris, 2001). However, there has been a shift away from the earlier didactic methods of instruction of the 1980s (Paris & Paris, 2001). More recent research has revealed that little has changed (Dignath & Veenman, 2021), with classroom instruction mostly implicit, if present at all. Problem-based learning and "authentic" tasks that de-emphasise teacher-led instruction have been seen as ideal classroom environments for researcher observation of self-regulated learning, leaving teachers with a lack of pragmatic advice about how best to impart these skills to students.

While the area of study skills does not suffer the same problems of definition, their implementation comes with its own complications. A body of research exists to support the efficacy of certain strategies, such as practice testing, distributed practice, elaborative interrogation, and self-explanation (Bjork et al., 2013; Dunlosky et al., 2013); however, these are not commonly taught in schools. Another issue is that study skills are usually put into practice independently and outside the classroom, meaning teachers have fewer means of monitoring student learning. The forethought

phase of self-regulated learning—the phase concerned with planning, setting goals, and selecting study strategies—marks a key distinction between novice and experienced self-regulated learners; novices tend to engage in minimal forethought, instead attempting to self-regulate reactively, whereas experts plan using powerful strategies (Zimmerman, 2002, p. 69), demonstrating why the deliberate and explicit teaching of such strategies is of fundamental importance.

1.5 Need-satisfying teaching

In addition to improving learning and study skills, teaching approaches should also be experiences that positively impact student motivation and well-being. Self-determination theory is a theory of motivation concerned with the "social conditions that facilitate or hinder human flourishing" (Ryan & Deci, 2017, p. 3). It defines three basic human needs, namely autonomy, competence, and relatedness (Deci & Ryan, 2000). These basic human needs have been found to be consistent across cultures (Chen et al., 2015), and when supported, are positively associated with student engagement and academic outcomes (Niemiec & Ryan, 2009). Through their actions and interactions, teachers can satisfy or frustrate these conditions, which are prerequisites for student wellbeing and growth (Niemiec & Ryan, 2009). Competence and

autonomy satisfaction are necessary preconditions of intrinsic motivation (Niemiec & Ryan, 2009), with ramifications for self-regulated learning which often takes place outside the classroom. Competence can be satisfied through teacher-provided structure, which may take the form of routines, support in meeting learning goals, and teacher feedback (Olivier et al., 2021), while autonomy can be satisfied through teachers allowing students' learning goals, values, and interests to guide instruction (Reeve & Jang, 2006).

1.6 Need for the study

Study skills are important for students to achieve optimal academic outcomes and due to their influence on student well-being. Typically, students habitually choose simple and ineffective study strategies (Dunlosky et al., 2013). Self-regulated learning and study skills are not typically taught (Zimmerman, 2002); however, more recent research has called for a greater emphasis on explicit instruction of these skills (Dignath, 2016; Dignath & Büttner, 2018; Dignath & Veenman, 2021). Much of the research into self-regulated learning is poorly conceptualised and interpretations of explicit instruction can be broad. Therefore, there is a need to further understand the role of explicit instruction in the teaching of self-regulated learning, specifically study skills. This research may have implications for supporting student well-being in an area typically associated with academic stress. ●

This study was conducted at Queenwood, an independent girls' school delivering NESA & IB curricula to approximately 900 students on Sydney's lower North Shore. A pilot group of approximately 170 students in Years 9 & 10 were explicitly taught self-regulated learning strategies in weekly 20-minute *Smart Study* lessons. Lessons are largely delivered as lectures, to ensure consistency of delivery, with tutors following up each term in one-to-one meetings with individual students.

600
SENIOR SCHOOL STUDENTS

3x
EDUCATIONAL ACCESS SCHEME APPLICATIONS (2020/2022)

77%
PARENTS LEVEL 1 PROFESSION

61%
ATAR OVER 90

3
CAMPUSES

STAGE 5
YEAR 9 & YEAR 10

Study purpose and research questions

Our research project examined the effectiveness of teaching self-regulated learning strategies to middle years students (Years 9-10), aiming to support student wellbeing and combat learned helplessness. The study took place at an independent girls' school with 600 students, a context that, while privileged in some respects, presents its own unique challenges. Since the COVID-19 lockdown, students' individual concerns, amplified by sensitivity to peer and parental influences, have become more pronounced. High academic expectations, in a school where 61% of students achieve an ATAR over 90, have created a disconnect between students' abilities and the expectations placed on them, leading to an increase in perfectionism among high achievers.

Notably, the percentage of students accessing the Educational Access Scheme for mental health issues related to academic pressures surged from 15% pre-COVID-19 to nearly 50% in 2022. This rise coincided with a noticeable decline in students' academic confidence, stemming from perceived incompetence, which negatively impacted their motivation and engagement in school.

In response, we implemented an intervention program focused on explicitly teaching high-utility learning strategies to address the increasing rates of academic stress. Both staff and parents had anecdotally noticed a concerning trend: students were demonstrating a lack of preparedness and independence in their learning, coupled with heightened emotional responses that seemed disproportionate to the academic challenges they faced. Many students in the target cohorts reported feeling overwhelmed by assessments, which severely affected their motivation and engagement. The implementation of our program coincided with the cohorts' first block of annual examinations, providing an opportune moment to introduce these strategies.

Our program sought to foster measurable improvements in student engagement and perceptions of competence and autonomy in their learning. By empowering students with self-regulation strategies, we anticipated an increase in motivation, engagement, and a stronger sense of achievement. The goal was to design a study skills program that helped students control, monitor, and regulate their behaviour, motivation, and cognition (Pintrich, 2000).

The core principles of Self-Determination Theory (Deci & Ryan, 2000) underpinned our approach. We aimed to offer structured support that promoted autonomy while teaching strategies to enhance students' sense of competence. Through this, we hoped to better align students' abilities with their academic expectations and equip them to navigate the pressures of school life more effectively. ●

The research questions guiding this project were:

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How might we best develop and deliver an effective study skills program?

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How do teacher perceptions of the explicit teaching of study skills change over time?

To what extent does the teaching of study skills reduce student academic anxiety?

Can we sustain this reduction over time?

Program implementation

Over three terms in 2022, the research team—including the Director of Research and Practice, Director of Wellbeing, Study Skills Coordinator, Director of Strategic Innovation, and the Year 9 Coordinator—met weekly to design the Study Skills program. Additionally, a larger group of staff interested in resource development met fortnightly in alternate weeks to plan the Smart Study curriculum. Each member of the team volunteered to develop expertise in a specific Smart Study outcome and was responsible for related staff professional development, lesson planning, and resource development. Throughout the process, individuals within the project team were assigned specific areas of interest and expertise in relation to the Smart Study curriculum. During this phase, a scope and sequence document was created, along with resources for program delivery, including study materials and booklets.

The scope and sequence was adapted from a study by Effney et al., 2013 and comprised eight outcomes:

TRANSFERABLE BEHAVIOURS

1   Organising & planning

2   Goal setting & motivation

3   Seeking information

4   Seeking social assistance

5   Environmental structuring

SUBJECT-SPECIFIC SKILLS

6   Rehearsing & memorising

7   Transforming

8   Self-evaluating

ABOVE: First year, Student Advisory Committee. LEFT: Students participate in lecture style sessions. BELOW: The Smart Study resource booklet.

First year of implementation

In 2023, Year 9 and 10 students participated in a weekly Smart Study program within their wellbeing time. Sessions were held in a lecture theatre for 20 minutes each week. Each student received a Smart Study resource booklet to complete activities and access materials during sessions. Stage 5 tutors actively participated by observing and facilitating the lecture-style sessions. Tutors also held one-to-one meetings with students each term to coach them on goals, motivation, and general wellbeing. The Study Skills Coordinator kept staff updated about the Smart Study content and resources via briefings and emails, ensuring that staff were well-equipped to incorporate the strategies into their teaching.

A member of the Smart Study team convened with the Student Advisory Committee, which included one student from each tutor group (15 students total). The committee met each term, provided feedback to the research team, and communicated updates to their peers. During the initial meeting, the student advisors identified three key goals: offering feedback for improvement, ensuring smooth operations, and raising awareness of the program within and beyond the school. Adjustments were made based on their recommendations (see Second Year of Implementation).

The Director of Wellbeing also held parent seminars for each year group to inform them about Smart Study and its integration into the Year 10 program. This created a shared language for study skills, encouraging parents to engage in discussions about effective study routines. Parents appreciated the evidence-based recommendations for supporting their daughters, which were reiterated in Spotlight articles in the school's weekly newsletter and biannual magazine.

Second year of implementation

At the end of 2023, feedback was collected to refine the Smart Study program for the second year. Key changes included limiting the weekly program to Year 9 students, as the 2024 Year 10 students had already acquired high-utility skills and self-regulated learning strategies. Their focus would shift to mastering and applying these skills, though they could opt into additional sessions on specific strategies like Dual Coding. Feedback from the Student Advisory Committee also led to subject-specific content, with the Study Skills Coordinator collaborating with Heads of Academic Departments to integrate strategies into subject-specific homework schedules.

The committee further emphasised that students needed more time to practice new skills. They found the weekly introduction of new strategies overwhelming and lacking time for effective implementation. As a result, the scope and sequence was updated to focus on teaching a skill one week and allowing students to practise it with their tutor the next week. This shift provided more time for skill development across different subjects.

In 2024, a significant change was made to how resources were distributed. Instead of providing Smart Study booklets at the start of the program, they were given to students at the beginning of Term 3. This prevented students from becoming overwhelmed by too much content early on and reduced distractions during lectures. The booklets were then used as revision tools for upcoming exams. Students also accessed a digital learning platform, which provided PowerPoint presentations and worksheets covering various high-utility strategies.

The second year also saw a shift in the lecture format. Instead of large lecture sessions, students were moved to smaller settings to create a more focused environment for feedback and progress monitoring. Feedback indicated that the original larger setting was overwhelming and made it difficult for students to manage distractions.

ABOVE: Study cards were developed with subject specific content. BELOW LEFT: Second year, Student Advisory Committee. BELOW RIGHT: Students engage in small group discussion about their study habits.
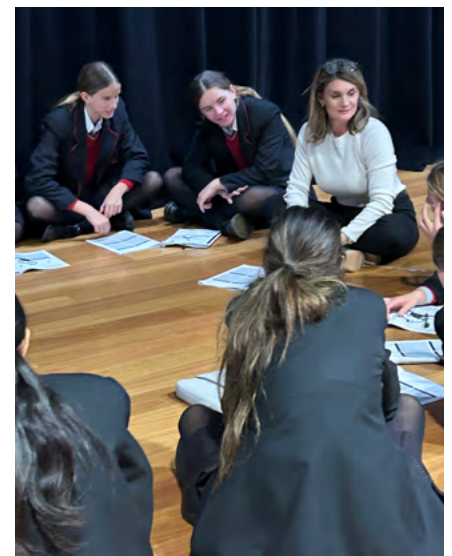
Operational considerations

TIMETABLING

Several operational issues needed to be addressed to implement the program effectively. Staff timetables were adjusted to allow the research team to meet for one hour every fortnight. On alternate weeks, a larger group of staff involved in resource development met for planning the Smart Study curriculum. Four key members of the research team also attended the Association of Independent Schools of NSW (AIS) meetings several times per year, which was invaluable for project development.

For students, additional time was allocated to their existing weekly wellbeing sessions, with a 20-minute block added. In the first year, the Student Advisory Committee met with the Smart Study team for a 45-minute session each term during lunch.

BUDGET

The budget for Smart Study covered resources for both students and staff. Each student received a resource booklet designed by the school's team, along with Smart Study bookmarks that provided quick reminders of key strategies. To ensure a consistent message across the school, weekly email updates were sent to staff, and High Impact Homework cards and posters were distributed for use in classrooms. These materials supported the integration of high-utility strategies in teaching.

SUCCESSION PLANNING

Staff turnover posed a risk to the program, with one team member moving to a new opportunity in 2024. Similarly, changes within the tutor group, due to long service leave and personal reasons, meant that some staff did not receive full professional learning or exposure to the program. Succession planning and ongoing dialogue with key pastoral leaders were crucial in maintaining consistent support for students. ●

Teacher focus groups

Teacher focus groups were conducted during the launch year of the Smart Study program, both at the program's start and at the end of that first year. A notable shift in teacher confidence regarding explicit instruction of study skills, along with their perceptions of student engagement and self-regulated learning, emerged from their feedback.

Before implementing the study skills program, teachers' understanding of self-regulated learning expanded to include student choice and strategy use, whereas initially, they viewed it mainly as awareness of learning. Teachers also reported a marked increase in student engagement and responsibility, with students taking more initiative in their studies. They acknowledged their pivotal role in fostering self-regulated learning, whereas earlier they had felt less confident, often citing time constraints as a major barrier.

The program also helped teachers appreciate the value of explicit instruction, reflecting on its importance for building foundational understanding. Finally, they recognised a need for consistent language and teaching strategies across subjects to improve learning. Over time, they noticed improved consistency, with students applying strategies learned in one subject to others, reinforcing their skills and understanding.

"I used to think…"

UNDERSTANDING OF SELF-REGULATED LEARNING (SRL)

Term 1 Quotes:

"Self-regulated learning… is being very aware and cognisant of their learning over a broad period of time of what's coming up, what's past."

"It's also the ability to check where they're at and how they're going so that they can keep on that predetermined path."

"Now I think…"

Term 2 Quote:

"We're aiming for them to have this idea of agency and efficacy. And … that choice of effective strategies and presenting them with a whole lot of things that they can then choose is part of that process of self-regulation."

EFFECTIVE STUDY TECHNIQUES

Term 1 Quote:

"You shouldn't just highlight your notes… understanding is more important than memorising."

Term 2 Quote:

"I feel a lot more confident in my own capacity to help students with their study strategies. I can suggest techniques like flashcards and brain dumps, with a clearer sense of direction."

VALUE OF USING EXPLICIT TEACHING TECHNIQUES FOR SRL

Term 1 Quote

"I don't feel confident in explicitly teaching study skills. It's hard to know if it's effective."

Term 2 Quote

"I think for me, Cornell notes work well when I model it up on the board. I'll do this first topic together, second topic together, third topic on their own."

"I used to think..."

PERCEPTION OF STUDENT ENGAGEMENT

Term 1 Quote:

"I don't know if they have the maturity to fully appreciate what's going on. They usually start doing something only after they get an assessment notification."

"Now I think..."

Term 2 Quote:

"I've noticed girls are actively using (the resources) because every time we finish the lecture we usually just collect those booklets. And last week I had several girls ask if they could take the booklets home to prepare for assessment because they actually want to use them."

APPLICATION OF TEACHING STRATEGIES

Term 1 Quote:

"They're slightly resistant to some of the techniques... because they're using what they've done already, which is writing and regurgitating notes."

Term 2 Quote:

"The biggest example I can think of is something like flashcards. All of a sudden – not every student is doing it – but many students are doing it, and they're putting together really purposeful, well-designed flashcards."

ROLE OF TEACHER IN GUIDING STUDY SKILLS

Term 1 Quote:

"It's hard to check what they're doing during tutor time. We only have ten minutes, and it's not always effective."

Term 2 Quote:

"I've definitely found that I'm taking more responsibility for helping my students use effective study skills. And so, I'm constantly suggesting flashcards, self-testing, brain dumps, much more than I ever was previously."

VALUE OF EXPLICIT TEACHING IN CLASSROOM INSTRUCTION

Term 1 Quote:

"The issue with explicit teaching is if you have a not very strong academic group... explicit teaching just falls apart because they're not engaged."

Term 2 Quote:

"I think I'm more conscious of how important it is to do it... If you don't do explicit direct instruction, those kids aren't going to learn a thing. But now I think, 'Hey, yeah, actually, I'm doing the right thing, and I know why I'm doing it. And I know the girls are going to be better off for it.'"

CONSISTENCY IN TEACHING ACROSS SUBJECTS

Term 1 Quote

"If we were using a more common language, I think the girls would be able... to actually know that I've done this in one subject and I can do it in another."

Term 2 Quote

"There's more consistency now, and I think the girls are starting to see how strategies used in one subject can be applied in another."

Methodology

Quantitative methods were employed to analyse Stage 5 students' responses via a digital survey. The survey was administered online, utilising a combination of established measures and measures developed for the purposes of the study. Measures were taken at the end of each term to examine trends over time.

Sample

The sample consisted of 179 secondary students from Years 9 and 10, with an approximate mean age of 15 years. This convenience sample allowed for the efficient collection of data within the targeted age group. However, there are limitations concerning the representativeness of the sample. The sample's demographics, including gender and socio-economic background, may not fully reflect the broader population of secondary students.
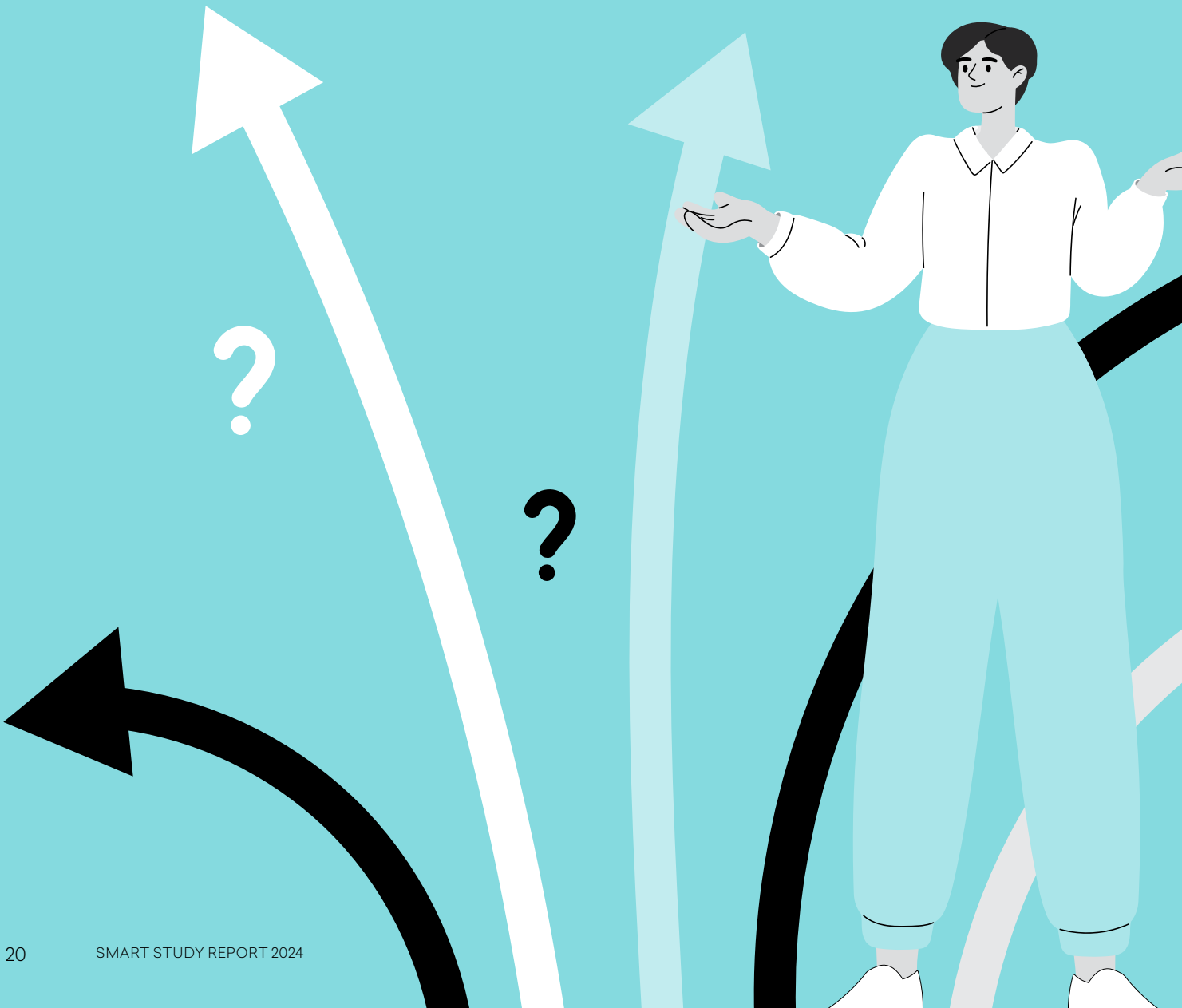
Procedure

As this research has human participants, approval was granted by UNSW Sydney Human Research Ethics Advisory Panel (HC230056). The school principal was provided with the research rationale and the implementation plan for approval. Informed consent, ability to withdraw at any time, and information about data collection and storage was explained clearly to students and their parents/carers prior to data collection. This research was deemed to be no greater than low risk, where no identifying data was collected, to maintain students' confidentiality, privacy, and anonymity.

The online survey was conducted through Qualtrics at three time points in the school year – April, June, and November. Baseline data was collected before the commencement of the study skills lessons. A 6-month follow-up measure was taken in Year Two of the study, to ascertain whether the results would be sustained over time.

Measures

Unless otherwise stated, all measures below were preceded by a sentence stem, "In the context of the study skills program, …" and used a 7-point Likert scale (7 = Strongly agree, 1 = Strongly disagree and 4 = Neither agree nor disagree).

Study engagement

Engagement refers to the cognitive, affective, and behavioural activities that students do in order to learn (Fredricks et al., 2004). Students responded to the Engagement section of the Motivation and Engagement Scale (MES; Martin, 2007), which comprises three subscales, each indicated by three items. Students responded to the item stem, "When I am studying, …." Planning is the extent to which students plan and keep track of their progress (e.g., "before I start studying, I plan out how I am going to do it"). Task management is the way students use their time, organise their timetable, and arrange where they will study (e.g., "I usually study in places where I can concentrate"). Persistence refers to how much students keep trying to work out an answer or solve a problem even when the problem is challenging or difficult (e.g., "When I am studying, if I can't understand something at first, I keep going over it until I do").

Enjoyment of school

Enjoyment of school refers to students' positive attitudes and willingness to attend school. Students responded to the prompt, "How do you feel about school generally?" (sample item: "I look forward to school") (Martin, 2009).

Basic psychological needs

Much like physiological or biological needs (such as water, oxygen, and nutrients from food), humans also have psychological needs (Ryan & Deci, 2017). When these needs are satisfied, people can pursue their natural orientation towards psychological growth, integration, and wellness. Needs satisfaction is therefore an indicator of wellbeing. Autonomy and competence were selected as the most salient needs for the current context. Autonomy refers to the need to experience activities as volitional, aligned with one's interests and concordant with one's sense of self. Competence refers to feeling effective and capable to achieve desired outcomes.

Autonomy and competence satisfaction were measured using items adapted from the Basic Psychological Need Satisfaction and Frustration Scale. Students rated their autonomy satisfaction and competence satisfaction, each represented by four items. Examples included, "I feel like I can make decisions about how I really want to study" (autonomy

satisfaction), and "I feel capable when I am studying" (competence satisfaction).

The full list of items can be seen in the Appendix. This scale has been validated in extensive previous work, including an international validation study over four different cultures and languages (Chen et al., 2015), and subsequent applied research in educational settings, including with adolescents at school (e.g., Aelterman et al., 2016; Jang et al., 2016; Li et al., 2019). In a previous study (Chen et al., 2015), the reliability of the scale has been demonstrated (e.g., satisfactory internal consistency indices and replication of factor structures).

Study anxiety

Students responded to three items from the Anxiety subscale of the Motivation and Engagement Scale (MES; Martin, 2007). Anxiety refers to feelings of apprehension, worry, or nervousness. In relation to study skills, anxiety can relate to an uneasy or sick feeling in relation to assessments or worry and fear in relation to not doing well in assessments (Martin, 2007).

Students rated their study anxiety, represented by four items. Examples included, "When exams and assignments are coming up, I worry a lot."

This scale has been validated in extensive previous work, including a study of teachers' enjoyment and confidence in teaching as influenced by their perceptions of student motivation and engagement (Martin, 2006), research in senior school contexts (Nagabhushan, 2012; Plenty & Heubeck, 2011) and in subsequent research with university students in EFL contexts (Yu et al., 2019).

Teacher support

Teacher-provided structure was measured using the short version of the Load Reduction Instruction Scale (LRIS-S; Martin & Evans, 2018), which operationalises cognitive load theory to provide a measure that can be used in naturalistic settings like the classroom. Students completed five items, adapted to the context of study skills using a stem asking students

to "Consider the lessons focused on study" when responding.

Other than reference to the study skills "tutor" and the context, "In wellbeing lessons," the items were otherwise unchanged from their original form. The original LRI-S comprises an overarching LRI factor, with five subfactors, each indicated by five items. In the short version, an overarching load reduction instruction factor is indicated by five items (i.e., one item for each of the LRI subfactors). Previous research has demonstrated this robust factor structure (Martin et al., 2021, 2023; Martin & Evans, 2018), as well as external validity evidence in the form of expected associations with students' perceptions of cognitive load (Martin & Evans, 2018) and an association with a structured teaching style (Evans et al., 2024).

Self-regulated learning

The Self-regulated Learning Scale, developed for the purposes of the study, required students to rate their understanding of a list of study skills that were the target of the Smart Study program. In the context of study skills, self-regulated learning is reflected in the way students plan study sessions, identify effective study strategies, monitor their progress towards understanding, and reflect on ways to improve their study skills (Zimmerman, 1998).

The items were derived from a study aimed at identifying the key self-regulated learning strategies utilised by adolescent students (Effeney et al., 2013), which in turn were derived from the Self-Regulated Learning Interview Schedule (Zimmerman & Martinez-Pons, 1988). The items also aligned with Dunlosky's identified effective strategies (Dunlosky et al., 2013). Therefore, the items exhibited face validity in relation to the research into both self-regulatory practices and study skills. Students were asked to rate their understanding of the study strategies on a Likert scale of 1–5, ranging from "limited" understanding to "extensive."

Data analysis

In this study, data were collected at multiple time points (Terms 1 through 4 in the first year, with a follow-up at six months into Year 2 of the study). Each variable was assessed using mean scores (M) and 90% confidence intervals (CI). The analysis focused on identifying longitudinal changes across these terms for the various constructs measured. The Year 2 follow-up was intended to provide an indication of whether the intervention was sustained over time, but statistics from this time point are interpreted tentatively given that approximately half of the students had left the sample (from Year 10 into Year 11), and been replaced by incoming students who had experienced only one school term of the Study Skills program.

For each construct, mean scores and confidence intervals were calculated to capture central tendencies and variability. Changes in these variables over time were analysed to identify trends. Statistically significant differences between terms were marked with an asterisk (*), indicating p-values less than 0.08, a level of statistical significance deemed appropriate for the present study given the small sample size. This highlights where the differences are unlikely due to chance, drawing attention to meaningful changes across terms. Additional information on scoring and measurement models is provided in the appendix.

Key variables, such as task management, persistence, competence satisfaction, and autonomy support, were analysed for significant shifts in engagement, motivation, and support over time. Additionally, the progression of self-regulated learning strategies—such as goal setting, environmental structuring, and self-evaluation—was tracked over the terms, with significant improvements marked accordingly. These patterns provide insights into the evolving nature of student engagement and self-regulation across the academic year.

Results

Study engagement

Descriptive statistics for study engagement, as shown in the appendix, reveal varying trends across the different subscales of task management, planning, and persistence. Task management scores remain relatively stable over time, with a slight decline in Year Two of the study. In contrast, planning and persistence show strong improvements, as indicated by the asterisks, reflecting statistically significant changes (p < 0.08).

The data table in the appendix summarises the mean (M), 90% confidence intervals (CI), and standard deviation (SD) for the subscales of study engagement across four terms, with a follow-up measure in Year Two.


IMAGE 1: Study Engagement
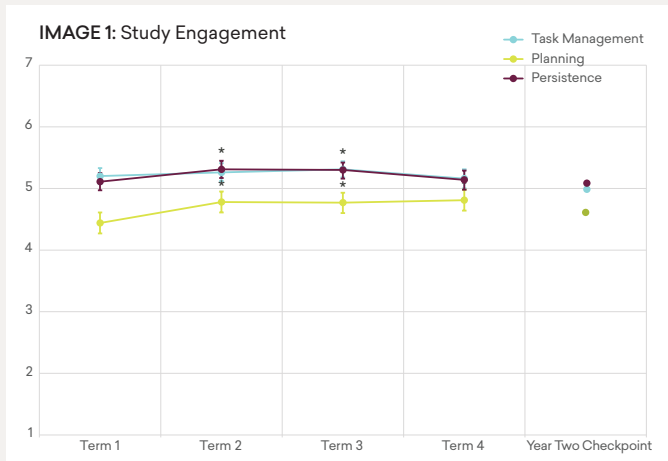
Enjoyment of School

Enjoyment of school (shown as school participation), in particular, exhibits a sharp increase between Terms 1 and 2, seen in Image 2, and this improvement is sustained through to Year Two. The confidence intervals provide further insight, with narrower intervals observed for most variables over time, reflecting greater precision in these estimates as the project progressed. Interestingly, the Term 4 measure was taken a week before the Year 10 cohort sat their first formal examination block.

IMAGE 2: Enjoyment of School
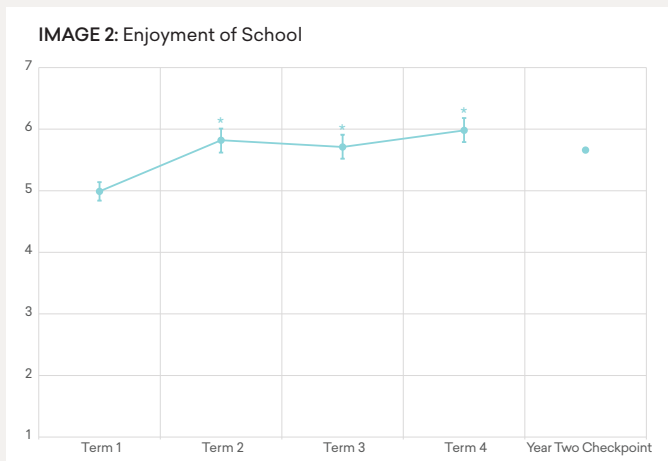
Basic psychological needs

Descriptive statistics for basic psychological needs, presented in the data table in the appendix, show upward trends for both competence and autonomy satisfaction over time. Competence satisfaction consistently increased from Term 1 to Term 3, with statistically significant improvements (p < 0.08) marked by asterisks. However, a slight decline is observed in Year Two, though the mean remains higher than the initial measurement.

Similarly, autonomy satisfaction shows significant improvements between Terms 1 and 2, and these gains are sustained across subsequent terms, with a marginal drop by Year Two. The confidence intervals reflect consistent precision throughout the study, with relatively narrow ranges across all time points.

The data table in the appendix provides a summary of the mean (M), 90% confidence intervals (CI), and standard deviation (SD) for competence and autonomy satisfaction across four terms, with an additional follow-up in Term 6.


IMAGE 3: Basic Psychological Needs
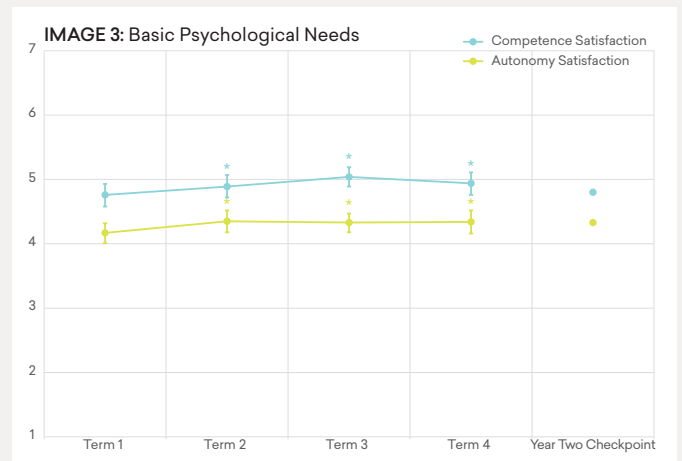
Study anxiety

Descriptive statistics for study anxiety, as shown in the data table in the appendix, indicate a gradual decrease in mean scores over time. Notably, this reduction was sustained at the 6-month follow-up, extending into the second year of the project. The narrowing confidence intervals suggest increased precision in the measurement of mean scores across the terms.
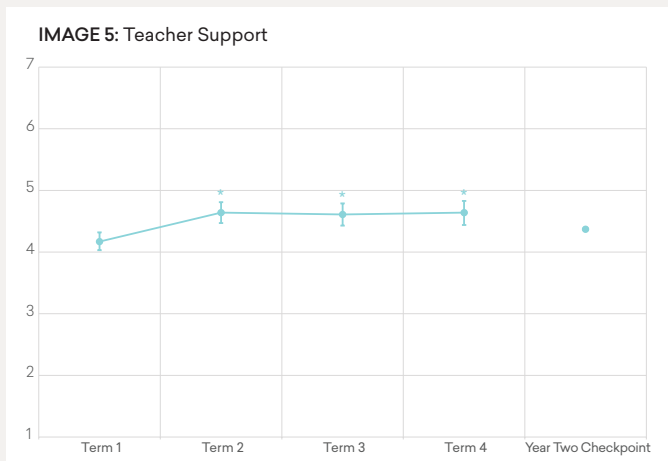
The data table in the appendix provides a summary of the mean (M), 90% confidence interval (CI), and standard deviation (SD) for study anxiety across four terms, with an additional follow-up measure taken six months later.

IMAGE 4: Study Anxiety
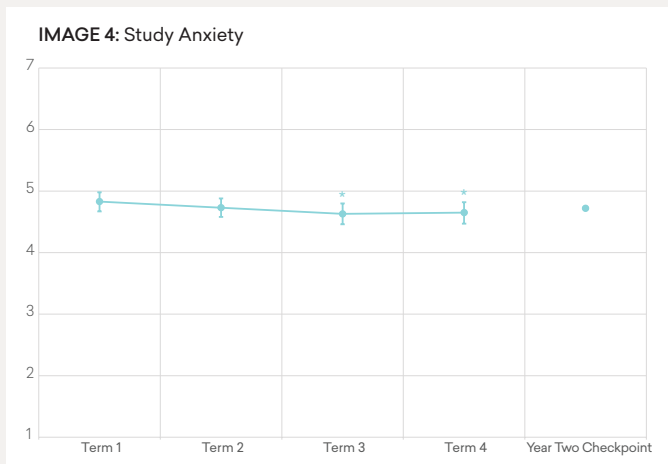
Teacher support

The descriptive statistics for load reduction instruction, as detailed in the appendix, show a significant upward trend between Term 1 and Term 2, marked by asterisks (p < 0.08). This improvement is sustained through Term 4, though a slight decline is observed at the 6 month checkpoint. Despite this decrease, the scores remain above the baseline, indicating lasting effects of the support provided over time. The confidence intervals remain relatively consistent, reflecting stable precision in the estimates across terms.

The data table in the appendix summarises the mean (M), 90% confidence intervals (CI), and standard deviation (SD) for load reduction instruction across four terms, with a follow-up after 6 months.

IMAGE 5: Teacher Support

Self-regulated learning

The descriptive statistics in the data table in the appendix show self-regulated learning measures across four academic terms and a 6-month checkpoint reveal a trend of improvement over the first year, followed by slight declines at the 6-month checkpoint. All variables, including Environmental Structuring, Organising and Planning, Seeking Information, Seeking Social Assistance, Goal Setting, Rehearsing and Memorising, Transforming Information, and Self-Evaluating, showed consistent increases from Term 1 to Term 4. This indicates significant progress in self-regulated learning behaviours over the first year of the study.

However, at the 6-month checkpoint, a decline was observed across all variables when compared to Term 4. Despite this decrease, it is important to note that none of the variables fell below their baseline levels from Term 1. For instance, Environmental Structuring, which started at 2.31 in Term 1, peaked at 4.09 in Term 4 and then declined slightly to 3.60. Similarly, Organising and Planning improved from 4.65 to 4.96 before dropping to 4.87 at the checkpoint.

Overall, while a decrease was observed after the first year, the results demonstrate that self-regulated learning skills had been significantly enhanced compared to the baseline, with sustained improvements even after six months. These findings suggest that initial learning gains were retained, with some fluctuation.

IMAGE 6: Self-regulated Learning
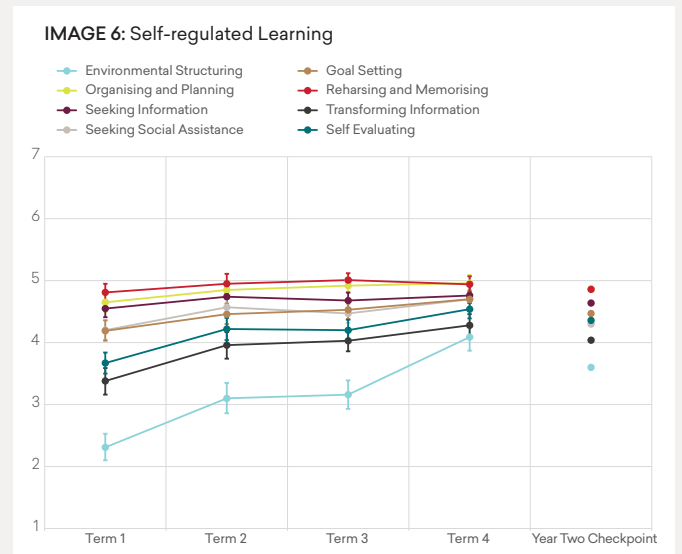
Discussion

Study engagement

The findings show positive trends in study engagement, with significant improvements in planning and persistence as reported by the students. These self-reported gains reflect increased perceived confidence in students' ability to organise and sustain their efforts, aligning with Fredricks et al. (2004), who suggest that engagement is critical for learning success. Students reported feeling more confident in their persistence when tackling challenging tasks, highlighting the role of explicit instruction in self-regulated learning strategies. However, the slight decline in task management at the Year 2 checkpoint suggests that maintaining this perceived confidence requires continuous support, consistent with Effeney at al. (2013), who emphasise the importance of reinforcement to prevent reverting to less effective habits.

Enjoyment of School

Students' enjoyment of school improved alongside their perceived confidence in managing school demands. The increase in school participation suggests that students felt more prepared and positive about their academic involvement, which aligns with Martin (2009), who found that increased engagement and enjoyment are often connected. Despite the timing of assessments before major exams, students maintained higher perceived confidence in their ability to engage with schoolwork, reducing the emotional burden typically associated with school pressures.

Basic psychological needs

The significant self-reported gains in competence satisfaction and autonomy satisfaction highlight the program's success in addressing students' basic psychological needs. Students expressed greater confidence in their ability to meet academic challenges, with increases in competence satisfaction reflecting a growing belief in their study capabilities. Similarly, students reported feeling more autonomous in their learning, as shown by the improvement in autonomy satisfaction. These outcomes align with Self-Determination Theory (Ryan & Deci, 2017), which emphasises that autonomy and competence are central to motivation and wellbeing. However, the slight decline at the Year 2 checkpoint indicates that continued support is necessary to maintain students' perceived confidence in these areas.

Study anxiety

Although students reported a gradual reduction in study anxiety, these improvements were modest and largely short-term. The slight increase in anxiety at the Year 2 checkpoint suggests that the program had a more limited effect on reducing long-term anxiety. Since study anxiety is a proximal measure, closely tied to students' immediate academic concerns, it may be harder to shift with school-based interventions. Despite the initial reduction, the findings suggest that more targeted, ongoing strategies are needed to address this issue comprehensively. By enhancing competence and autonomy, the program contributed to lower anxiety in the short term, but further, possibly more specific, efforts are needed to sustain these benefits.

Teacher support

The self-reported increase in teacher-provided structure reflects students' awareness of the explicit instruction they received during the study skills lessons. Students felt that teachers provided clear and consistent instruction, which helped them apply the strategies learned in the program. However, the modest decline in these perceptions at the Year 2 checkpoint indicates that sustaining these gains may require further refinement. This is consistent with Martin and Evans (2018), who found that students benefit from structured teaching approaches, but these need to be continuously reinforced to maintain their effectiveness.

Self-regulated learning

Significant self-reported improvements were observed in students' self-regulated learning strategies, including organising and planning, goal setting, and transforming information. Students reported increased confidence in their ability to manage their learning and apply these strategies effectively, supporting Zimmerman's (2002) view that self-regulation can be taught explicitly. The slight decline in these measures at the Year 2 checkpoint suggests that students may need continuous reinforcement to maintain their confidence in applying these strategies. However, none of the measures fell below their initial levels, indicating the program's continued efficacy into the second year. This underscores the importance of ongoing support and practice to sustain self-regulated learning behaviours (Dignath & Veenman, 2021). ●
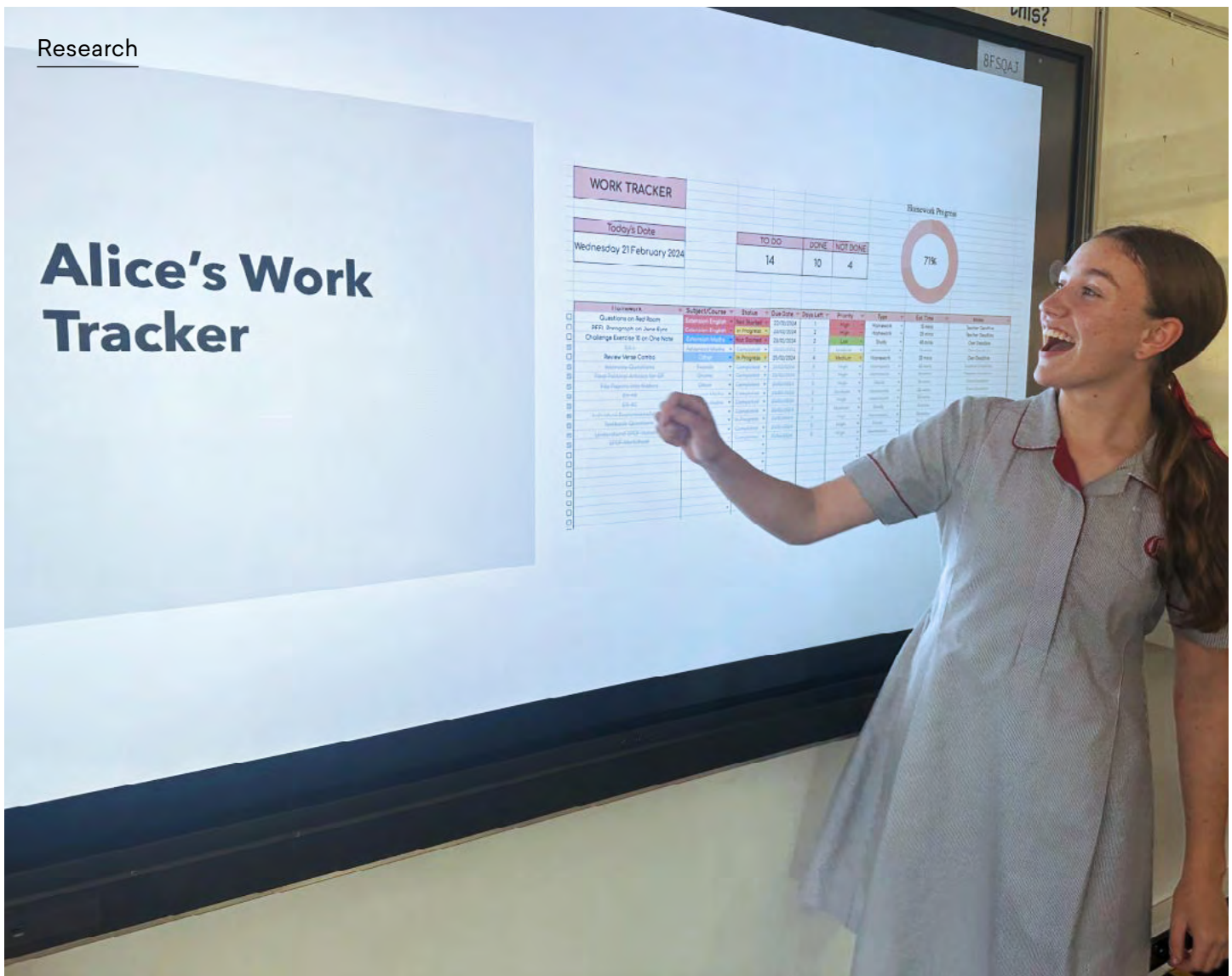
Research to practice impact

The implementation of a study skills program that explicitly teaches self-regulated learning strategies has sparked a significant cultural shift within the school.

Firstly, there has been an unintended but impactful transformation in teachers' pedagogical practices. The program has encouraged staff to incorporate retrieval strategies like 'do nows', brain dumps, and retrieval grids into their lessons. These techniques not only reinforce the strategies and outcomes of the study skills program but also enrich overall teaching approaches across subjects. By embedding these methods, teachers provide students with consistent opportunities to master self-regulated learning while simultaneously enhancing their own instructional practices. Additionally, when assigning homework, faculty members use consistent language aligned with the program's aims to ensure continuity. Staff were briefed on 'high-impact homework' and encouraged to promote the high-utility strategies learned through the study skills program in their classrooms.

Secondly, the program has initiated a transformative shift in the support provided to high-needs students, including those with learning disabilities. The school's Specialised Program department has moved away from withdrawal sessions, which unintentionally reinforced learned helplessness, to more empowering in-class support practices. This shift has given teachers greater confidence that students have the effective strategies needed for academic success. By focusing more on fostering students' competence and independence within the classroom, the program has more fully realised its emphasis on self-regulated learning. This integrated support model helps students develop academic resilience and confidence, reflecting a broader cultural shift towards inclusive and empowering educational practices. ●

Recommendations for practice

Self-regulated learning is an essential capability, but often, neither time nor training is allocated by Australian schools. Given that the core function of teaching is to ensure that students remember, it is important that these skills are not framed as "extra", but rather essential. Many teachers do not know enough about these strategies to bring them to their students (Dunlosky et al., 2013). The Australian Education Research Organisation (2021) found that only 48% of surveyed teachers utilise research evidence in their practice, suggesting that a lack of explicit instruction in study skills reflects a broader research-practice gap. Currently, few universities teach either the theoretical or practical foundations of how to optimise learning and memory, as evidenced by the findings of the recent Strong Beginnings (Teacher Education Expert Panel, 2023) report into initial teacher education.

The Queenwood study had the luxury of generous resource allocation, but these practices could be embedded into specific subjects, with the appropriate teacher training.

Short, timetabled sessions, during allocated wellbeing time, are ideal for the teaching of study skills. It is also recommended that schools schedule time to practise skills. Content should be taught explicitly, using worked examples that are aligned to curriculum. There is a lack of evidence to suggest that skills are generic and transferable (Willingham, 2008), therefore embedding these skills into classroom practice, using domain-relevant content, is advisable in the absence of discrete timetabled sessions.

Change management protocols can help schools with the sustainability of projects such as this. The ADKAR model (*The Prosci ADKAR® Model* | Prosci, 2024) provided a framework for implementation in this case. Planning for opportunities to build awareness of the problem, a desire for change and the professional learning or knowledge required are crucial to a project's success. Similarly, the ability to implement the program, through operational support, time allocation and teacher expertise, is essential. Recognition of the team's hard work

and impacts on students helps build and sustain momentum for a long-term project. Recognition can also be achieved by publicising the project itself, through channels like school newsletters, local media, parent seminars, grassroots conferences and the like. All of these practices help to ensure that the project remains both viable and visible into the future.

Leadership succession may prove an ongoing challenge for schools wishing to implement a program such as this one. In a climate of teacher shortages, it is important to consider key roles and the spreading of expertise beyond key individuals. Similarly, sustaining projects beyond the excitement and buy-in that accompanies the launch year can prove challenging. Planning for several action research cycles and allocating a project-lead with the support of a multi-faculty team can go some way to ensuring that the project is appropriately prioritised beyond the initial roll-out. ●

ABOVE: *The Prosci ADKAR® Model* RIGHT: Members of the original Smart Study team along with critical friend Assoc. Prof. Paul Evans.

Appendix

Survey items

NEEDS SATISFACTION (CHEN ET AL., 2015)
Item stem: When I am studying, …

Competence subscale

13	I feel confident that I can study well	SA A UN D SD
14	I feel capable when I am studying	SA A UN D SD
15	I feel competent to achieve my study goals	SA A UN D SD
16	I feel I can successfully complete difficult tasks	SA A UN D SD
17	I have serious doubts about whether I can study well	SA A UN D SD
18	I feel disappointed with my study performance	SA A UN D SD
19	I feel insecure about my study abilities	SA A UN D SD
20	I feel like a failure when I am studying	SA A UN D SD

Autonomy subscale

21	I feel a sense of choice and freedom when I am studying	SA A UN D SD
22	I feel that my decisions when I am studying reflect what I really want	SA A UN D SD
23	I feel my choices when studying express who I really am	SA A UN D SD
24	I feel I have been doing what really interests me	SA A UN D SD
25	Most of the things I do when I'm studying feel like "I have to"	SA A UN D SD
26	I feel forced to study in ways I wouldn't choose to do	SA A UN D SD
27	I feel pressured to do too many things when I'm studying	SA A UN D SD
28	My daily study activities feel like a chain of obligations	SA A UN D SD

LOAD REDUCTION INSTRUCTION (MARTIN & EVANS, 2018)
Item stem: Think about when you have learned about study skills from your tutor period teacher:

41	When we learn new things, the teacher makes it easy at first	SA A UN D SD
42	My teacher is available for help when we need it	SA A UN D SD
43	The teacher makes sure we practice important things we learn	SA A UN D SD
44	The teacher provides frequent feedback that helps me learn	SA A UN D SD
45	Once we know what we're doing, the teacher gives us a chance to work independently	SA A UN D SD

SELF-ASSESSMENT OF SKILLS SCALE (EFFENEY ET AL., 2013)

78	On a scale of 1 (lowest) to 5 (highest), how well do you use the following study skills?

	1	2	3	4	5
Self-evaluating					
Organising & transforming					
Goal-setting & planning					
Seeking information					
Keeping records & monitoring					
Environmental structuring					
Self-consequating					
Rehearsing & memorising					
Seeking social assistance					
Reviewing records					

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Content of Study Skills sessions

The curriculum comprised eight outcomes adapted from a study conducted by Effney, Carroll, & Barr (2013).

1. Self-evaluating
2. Organising & planning
3. Goal-setting & motivation
4. Seeking information
5. Rehearsing & memorising
6. Seeking social assistance
7. Transforming
8. Environmental structuring

The foci for each of the 20-minute sessions are outlined below.

TABLE 1: SAMPLE PROGRAM OF SKILLS TAUGHT

SKILLS	TERM 1	TERM 2	TERM 3	TERM 4
Week 2	Environmental structuring	Goal setting and motivation	Low and high utility strategies	Planning for exam preparation
Week 3	Organising and planning our time	Flash cards conceptual and factual	Cornell note taking method	My study schedule
Week 4	Low and high utility strategies	Flashcards into practice (subject specific)	Help seeking behaviours	Directive terms for examinations
Week 6	Brain Dump (retrieval)	Interleaving	Focus and effective habits	Self-reflection and feedback
Week 7	Breaking down an assessment task		Directive terms	
Week 9	Dual coding			

Results

DATA TABLE

VARIABLE	TERM 1		TERM 2		TERM 3		TERM 4		HALF A YEAR LATER	
	M	90% CI	M	90% CI	M	90% CI	M	90% CI	M	90% CI
STUDY ENGAGEMENT										
Task Management	5.20	[5.07, 5.33]	5.26	[5.12, 5.41]	5.31	[5.18, 5.44]	5.16	[5.00, 5.31]	5.01	[4.84, 5.18]
Planning	4.44	[4.27, 4.61]	4.78*	[4.61, 4.95]	4.77*	[4.60, 4.93]	4.81*	[4.64, 4.98]	4.61*	[4.43, 4.80]
Persistence	5.11	[4.97, 5.25]	5.31*	[5.17, 5.45]	5.30*	[5.16, 5.42]	5.14	[4.98, 5.29]	5.11	[4.93, 5.29]
School Participation	4.99	[4.84, 514]	5.82*	[5.62, 6.01]	5.71*	[5.52, 5.91]	5.98*	[5.79, 6.18]	5.66*	[5.45, 5.87]
BASIC PSYCHOLOGICAL NEEDS										
Competence Satisfaction	4.76	[4.58, 4.93]	4.89*	[4.72, 5.07]	5.04*	[4.89, 5.19]	4.94*	[4.76, 5.11]	4.80	[4.64, 4.97]
Autonomy Satisfaction	4.17	[4.01, 4.32]	4.35*	[4.18, 4.52]	4.33*	[4.18, 4.47]	4.34*	[4.16, 4.52]	4.33	[4.18, 4.49]
STUDY ANXIETY										
Study Anxiety	4.83	[4.67, 4.98]	4.73	[4.58, 4.88]	4.63*	[4.46, 4.80]	4.65*	[4.47, 4.82]	4.72	[4.53, 4.91]
TEACHER SUPPORT										
Load Reduction Instruction	4.17	[4.03, 4.32]	4.64*	[4.47, 4.81]	4.61*	[4.43, 4.79]	4.64*	[4.44, 4.83]	4.37*	[4.19, 4.54]
Autonomy Support	4.66	[4.47, 4.85]	5.04*	[4.83, 5.24]	4.84*	[4.62, 5.06]	4.95*	[4.72, 5.17]	4.75	[4.54, 4.95]
Control	2.39	[2.19, 2.56]	2.14*	[1.95, 2.32]	2.30	[2.08, 2.53]	2.52	[2.27, 2.77]	2.44	[2.56, 2.62]
SELF-REGULATED LEARNING										
Environmental Structuring	2.31	[2.10, 2.53]	3.10*	[2.86, 3.35]	3.16*	[2.93, 3.39]	4.09*	[3.87, 4.31]	3.60*	[3.36, 3.83]
Organising and Planning	4.65	[4.50, 4.79]	4.85*	[4.71, 4.99]	4.92*	[4.80, 5.05]	4.96*	[4.83, 5.09]	4.87	[4.75, 4.98]
Seeking Information	4.55	[4.41, 4.68]	4.74	[4.59, 4.89]	4.68*	[4.55, 4.81]	4.76	[4.64, 4.94]	4.64	[4.49, 4.78]
Seeking Social Assistance	4.20	[4.05, 4.36]	4.57*	[4.42, 4.71]	4.47*	[4.32, 4.62]	4.70*	[4.57, 4.83]	4.30*	[4.14, 4.46]
Goal Setting	4.19	[4.03, 4.36]	4.46*	[4.30, 4.63]	4.53*	[4.38, 4.68]	4.70*	[4.55, 4.84]	4.47	[4.33, 4.62]
Rehearsing and Memorising	4.81	[4.66, 4.95]	4.95	[4.80, 5.11]	5.01*	[4.89, 5.12]	4.94	[4.81, 5.07]	4.86	[4.72, 5.00]
Transforming Information	3.38	[3.16, 3.59]	3.96*	[3.74, 4.17]	4.03*	[3.86, 4.21]	4.28*	[4.09, 4.46]	4.04*	[3.87, 4.22]
Self Evaluating	3.67	[3.50, 3.84]	4.22*	[4.04, 4.40]	4.20*	[4.04, 4.37]	4.54*	[4.39, 4.68]	4.36*	[4.21, 4.52]

Appendix

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Statistical notes

Statistical significance was determined by comparing the factor mean of the latent variable in each measurement point with the factor mean of Term 1, 2023.
Due to the small number of participants, the threshold for statistical significance (alpha) was set at $p < 0.08$. In the graphs, error bars indicate 90% confidence intervals of the mean (approximately equal to the tests of statistical significance).

For data (except self-regulated learning) from terms 1 to 4 in 2023, the means are estimated using latent variable modelling (confirmatory factor analysis) incorporating longitudinal measurement invariance. Self-reports are subjective measures by nature, and the interpretation of self-report items and response categories may vary over time. Longitudinal invariant models address this by holding factor loadings and item intercepts to be equal over each measurement point. Correlations between error variances of items were freely estimated. Due to model convergence issues, the school participation measure was modelled in the first three terms to estimate the means, and then separately for other time points. The 90% confidence interval provides a relatively conservative consideration for interpreting whether statistically significant changes were detected across time points.

For data at the 6-month follow-up, each factor was modelled with the corresponding data collected in Term 1, 2023 to estimate the means using scalar models. Due to issues with model convergence for the teacher control and motivation measures, means were estimated using mean scale scores.

For data of self-regulated learning, the mean of each factor at each measurement point was based on each single item. Statistical significance was determined using paired t-tests.

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