



teach
learn
share

The Hume Region Numeracy Strategy at Seymour College

- > [Summary](#)
- > [Target student group](#)
- > [Method](#)
- > [Results](#)
- > [Lessons learned](#)
- > [Next steps](#)
- > [Research base](#)
- > [Further reading and links](#)
- > [Contacts](#)





teach
learn
share

Summary

How can schools meet the individual numeracy needs of all students?

In 2010 NAPLAN results and On Demand data revealed that a majority of the students at Seymour College were performing below or well below expected levels in the curriculum area of number fluency. The aim of this intervention was to improve student outcomes in this area of numeracy. Targeting students from all student groups from years F–6, the focus was on students' pre-existing number understandings, teaching number in depth and developing independent learning. Scaffolding techniques matched students to specially developed tasks and connected their learning.

The intervention at Seymour College used an assessment tool that was a component of the Hume Region Numeracy Strategy 2008–09. It involved teacher interviews with students as they performed assessment tasks to determine the strategies they were using in regard to specific numeracy skills.

'The tasks really work – they make a difference as you can see the strategies the students have learnt are used in their daily maths lessons. It also allows me to plan for students' point-of-need learning activities.' (Grade 3/4 teacher, 2011)

Target student group

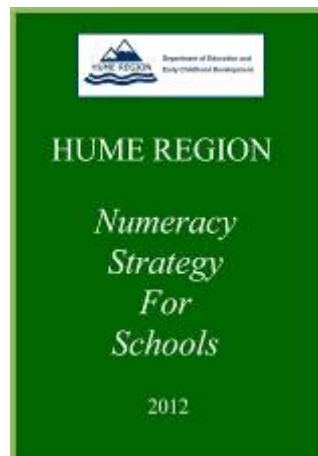
Seymour College is situated in the Department of Education and Early Childhood Development's Hume Region, a semi-rural area of Victoria. The college is the result of a merger of four schools (two state primary schools, a secondary school and a special school) into one integrated P–12 college, currently operating on four campuses. The initiative targeted students from all student groups in years F–6. All classroom teachers participated and were supported in its implementation. Fourteen teachers and 250 of the students involved were at the Foundation to year 4 campus, and five teachers and 110 students at the years 5 and 6 campus.



teach
learn
share

Method

The intervention at Seymour College was based on an approach to meeting the individual numeracy needs of students outlined in the Hume Region Numeracy Strategy 2008–09.



Copyright Hume Region DEECD

The focus of the initiative was number fluency. Its key points are finding students' pre-existing number understandings, teaching number in depth and developing independent learning. Scaffolding techniques match students to specially developed tasks and connect their learning.

The Hume Region Numeracy Strategy incorporates the Hume Numeracy Assessment Tool, which involves the teacher interviewing students individually as they perform assessment tasks to determine the strategies they are using on the developmental pathways of counting, numeration, addition and subtraction, multiplication and division. All students in the school were assessed using the Hume Numeracy Assessment Tool.

Training enabled all staff members to deliver the assessment tool and to record and use the data effectively. Follow-up professional learning team meetings ensured the training was thorough and consistent.

'Before I came to the maths lessons I was not able to do my divisions, and now I can do division. I really enjoyed doing it.' (Grade 4 student, 2011)



Individualised curriculum

Students' results were profiled onto a whole class profile spreadsheet according to their specific skills and stage of development. This data identified 'point-of-need' teaching and directed the teacher to exactly what the student required. Teachers used the information in their daily and weekly planning on how best to group students and which daily number fluency tasks to assign. They regularly updated numeracy assessment for each student, tracking growth on the spreadsheets to assist in planning for the next teaching and learning strategy for each student.

To meet each student's point of need and support their developmental pathway a wide range of fluency tasks was required: tasks that could be differentiated to meet individual needs. The tasks also had to be engaging for the learner and allow students to self-monitor, for example, by using a calculator or a counting chart. To meet this need staff at the Hume Regional office designed a series of fluency activities for each number developmental pathway, and teachers at the school produced them.

'I really learnt my multiplication. It helped me in class when we were doing multiplication and I was able to try and have a go. Using arrays has helped my multiplication.' (Grade 4 student, 2011)

Activities

Each teacher was then provided with a boxed set of the activities. An index of the activities for each pathway was included in the box. Teachers selected an activity according to the needs of the student and were able to 'tweak' the activity to make it easier or more difficult. Students did not need to complete all activities but they could work through them to gain important underpinning thinking strategies.

Student resource packs were also compiled to assist the students with doing the fluency activities. Each resource pack consisted of a plastic zip-lock bag containing dice, calculator, a pack of playing cards and a pencil.

The daily lesson plan allocated 10–15 minutes at the beginning of each numeracy lesson for students to practise their individualised tasks to build fluency. Teachers aimed to ensure students understood where they were on the learning continuum and developed their capacity to take some responsibility for their learning.



teach
learn
share



Copyright Seymour College



Copyright Seymour College



Copyright Seymour College



Copyright Seymour College



Results

Due to the school's participation in a Regeneration Project, four schools were merged into a single new school on four campuses, which made it difficult to track cohort data. Also, the use of spreadsheet data to record results was only initiated in 2011.

Assessment data was triangulated using summative forms of data such as On Demand Number assessments (an online assessment resource linked to Victorian curriculum and standards) and published diagnostic tests.

Although growth has been modest in the 2011 grade 3 cohort, growth in the 2011 grade 4 cohort, as measured by On Demand Number assessment in September 2011 and again in March 2012, after a whole year using the tasks, showed a large effect size of 0.7. To put this into perspective, a 1.0 effect size in student learning 'would mean that on average students receiving that treatment would exceed 84% of students not receiving that treatment' (Hattie 2009, p 8). Teachers' observations of improved learning have corroborated this data which found 'greater than expected growth for primary students in a six month period' (Vale et al 2010).

It is anticipated that in the current year (2012) the school will be able to make comparisons with 'between-year' growth.

Lessons learned

The initiative has allowed for a consistent approach in relation to the recording of data as well as implementing a consistent teaching model across the grades. All classes are implementing the initiative and data is carried forward at the end of the year, which enables teachers to plan for their next cohort of students prior to school starting.

A notable lesson has been the value of using graphic data from the electronic spreadsheets to plan explicit lessons. Initially, the information from the numeracy assessment was provided in a general table format. All data is now collated onto a specific skills-based spreadsheet which enables the production of graphed data. Seeing the result in a graphic format has enhanced teachers' ability to plan for students' specific learning needs. This supports Hattie's theory that when data is graphed, effect sizes are greater than when data is simply recorded (Hattie 2009, p 181).

The program was funded through school cluster funding with materials costing \$1,200.00 and administrative costs of \$250.00, totalling \$1,450.00. However, this does not take into account the considerable teacher and parent time put into producing the resources.



teach
learn
share

The fluency tasks required photocopying of resource pages for each of the number pathways (30 counting activities, 18 numeration activities, 60 addition and subtraction activities and 22 multiplication and division activities). Parents spent many hours laminating these pages which then had to be compiled with the appropriate materials. Now that the resources are prepared the ongoing costs are minimal. Staff are also adding their own differentiated tasks to each of the kits and increased ownership of the strategy becomes evident over time.

Advice for other schools

The initiative has been implemented in a Hume Region school which means it has whole-school as well as additional cluster and regional support. It is Victorian Essential Learning Standards (VELS) based and has common understandings across Hume Region schools. For the initiative to be successfully replicated elsewhere in Victoria, training would be required in the Hume Numeracy Assessment.

A whole-school commitment to the implementation of the initiative would be beneficial along with the following essential components:

- the support of a dedicated numeracy leader or coordinator
- knowledge of the Hume Region Numeracy Strategy
- knowledge of the assessment materials
- fluency tasks for each classroom
- teacher capacity to input data onto a spreadsheet and ensure regular updating.

Next steps

Although limited at this point, the data is encouraging. The college will continue the program as students are highly engaged in tasks at their point of need and staff demonstrate ongoing commitment to its implementation. They value the capacity to track and record student learning and use the information to plan and teach purposeful number lessons.

The program is sustainable as most of the costs of implementation are not repeated. Changes will be made as required in line with Australian Curriculum requirements but it is not anticipated that these will be sizable.

'I found my lessons helpful and now I am pretty good at maths. I am better at understanding my times tables, fractions and counting.' (Grade 4 student, 2011)



teach
learn
share

Research base

'Effective classrooms are organised around the pre-existing understandings of students. Connected concepts are taught in depth, and students are supported in monitoring their own learning.' (DEECD 2007)

The strategy builds on the principles of effective teaching that include planning learning that is based on students' knowledge, differentiating the curriculum according to need, and provision of lessons that focus on deep, connected numeracy understanding. The intervention involved using the Hume Numeracy Assessment Tool, which is a component of the Hume Region's Numeracy Strategy 2008–09.

The underpinning theory for this strategy is Vygotsky's Zone of Proximal Development (Vygotsky 1978), which focuses on three main ideas:


- Where is the student at?
- What is the next point for their learning?
- Teach in depth.


This requires assessment that identifies a student's pre-existing knowledge and thinking, that provides direction for daily lesson planning, and that leads to appropriate in-depth teaching that develops independent thinking.

The Hume Numeracy Assessment Tool provides this in the area of Number, which was the focus for Seymour College's intervention. The tool enables the teacher to pinpoint the student's zone of proximal development (Vygotsky, in Fullan, Hill & Crevola 2006, p 33), and the level of instruction that is at the student's point of need. Practice is then required to develop fluent understanding.

Further reading and links


Bransford, J, Brown, A & Cocking, R (eds) 2000, *How people learn*, National Academy Press, Washington, DC.

Department of Education and Training, Victoria 2005, '[Professional learning in effective schools](#)' .

Department of Education and Early Childhood Development (DEECD), Victoria, '[Key characteristics of effective numeracy teaching P–6: Differentiating support for all students](#)' .



teach
learn
share

Department of Education and Early Childhood Development (DEECD), Victoria, 2008, [‘Numeracy Strategy, Hume Region 2008–2009’](#) .


Fullan, M, Hill, P & Crévola, C 2006, *Breakthrough*, Corwin Press, Thousand Oaks, CA.


Hattie, J 2009, *Visible learning: a synthesis of over 800 meta-analyses relating to achievement*, Routledge, London.

Hume Region 2006, ‘Leadership capacity building in the Hume Region’, discussion paper, Hume Region, Department of Education and Early Childhood Development, Victoria.


Hume Region 2007, ‘Leading numeracy: the learner’, Hume Common Curriculum Module 1, Hume Region, Department of Education and Early Childhood Development, Victoria.

Hume Region 2007, ‘Leading numeracy: the classroom’, Hume Common Curriculum Module 2, Hume Region, Department of Education and Early Childhood Development, Victoria.

Vale, C, Weaven, M, Davies, A & Hooley N 2010, [‘Student centred approaches: teachers’ learning and practice’](#) , Victoria University.

VCAA, *On Demand Adaptive Tests* , Victorian Curriculum and Assessment Authority, Melbourne, Vic.

Vygotsky, L, in Fullan, M, Hill, P & Crévola, C 2006, *Breakthrough*, Corwin Press, Thousand Oaks, CA.

Waters, M & Montgomery, P 2008, [‘Leading numeracy: the learner. Common Curriculum for principals in Hume Region’](#) , in *Curriculum Leadership*, vol 6, no 4 ([Link](#)) (June 2012).

Contacts

For further information contact Seymour College at Seymour.co@edumail.vic.gov.au 