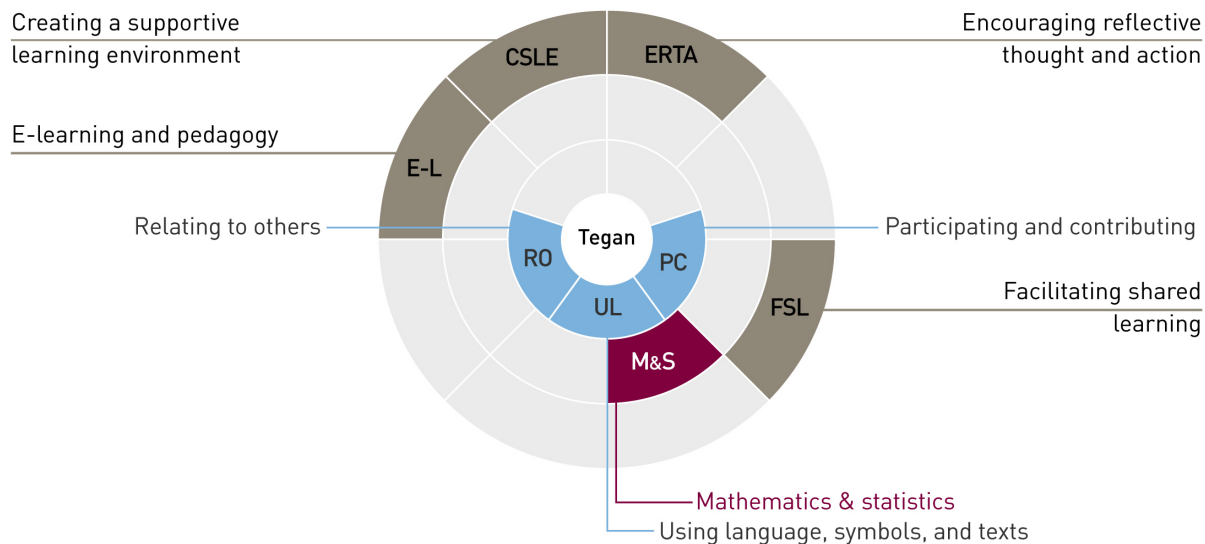


Tegan moves into mathematics

Links to the curriculum



Student background

Name	Tegan	In 2008 Tegan made the transition to her local co-educational high school. All areas of Tegan’s academic work are made more challenging by a considerable level of dyspraxia, which affects her speech, motor planning, and cognition.
Year	9	
School	Secondary	

Tegan has a personal laptop with the assistive writing program Word Q, which has an aural spelling component and helps her to write with increasing independence. The school receives ongoing and reviewable resourcing schemes (ORRS) funding to provide a specialist teacher, and teacher aide support for numeracy and literacy only. A meeting was held near the start of the year to explain to those teaching Tegan how best to create an inclusive learning environment for her. Flexibility, adaptability, and good communication among the special education needs co-ordinator (SENCO), subject teachers, Tegan, and Tegan’s family are seen as keys to her successful inclusion.

One string of learning stories

This string of learning stories (from February to June 2008) shows Tegan becoming an active and valued member of her mathematics class as she settles into secondary school life. Connections with peers provide valuable support and enhance Tegan’s learning.

Group work is great

Student	Tegan	Date	February to June 2008
Topic	Mathematics and statistics	Observer	Anne-Marie (specialist teacher, ORRS)

Tegan's achievement

Tegan attends a regular year 9 mathematics class. She has teacher aide and specialist teacher support in this subject. At the start of the year Tegan sat at the front of the classroom with her teacher aide beside her. Tegan told me she thought she had to sit there. She has since been encouraged by her specialist teacher to join a group of three other girls with whom she now sits and works in her mathematics class. Valuable social interactions that support Tegan's learning are occurring. Tegan is very happy to be part of this group. The teacher and the teacher aide give support where needed and independence is fostered. Change has occurred through empowering Tegan. Modelling by the specialist teacher and discussion with staff have supported this. The photos in this string demonstrate how changes in the environment can improve learning opportunities. Tegan is now an interdependent learner in mathematics.



29 February 2008

Tegan demonstrates independent work habits. She is solving addition equations using a hundreds chart. She is sitting directly in front of the teacher's desk. Her teacher aide usually sits beside her. The other girls in this class are sitting behind Tegan.



14 March 2008

The students are working on independent problem-solving activities. Tegan is sitting alongside a girl in her class. Her specialist teacher is available to help as needed. Tegan is independently solving addition and subtraction problems using a calculator.



23 May 2008

Tegan is part of the group of girls in this mathematics class. The teacher has organised the class into groups. The girls are all on different levels, working independently from a variety of books, on a range of number activities. Tegan's adapted programme meets her learning needs in the same way the other girls' mathematics programmes are focused on their strengths and needs.



13 June 2008

Tegan shares a mathematics chart about reading dials. The outcome is a joint effort by Tegan and another girl from her mathematics group. Both girls are proud of their work. Tegan understands what an indicator on a dial means. She is able to interpret where dashes represent numbers and can count in twos, fives, and tens. This new learning is facilitated through peer support.



20 June 2008

Tegan is using a maths programme consolidating and extending skills in subtraction. She independently gets her 100s chart so she can successfully solve the problems. Although the objects are on screen to count, the chart is a method she knows and likes. Tegan is sitting beside a peer. Students in this class are working on a variety of tasks. Tegan is focusing very well – particularly as this is last period on a Friday.



27 June 2008

Students in Tegan's mathematics class are completing a range of tasks at the end of the week. Tegan, having completed her work, is independently using mathematics software. A peer joins her. The class teacher is encouraging this interaction and another peer joins in. The three students spend time solving tangrams on Tegan's laptop.

Analysis – what learning is happening here?

Link to individual education programme

The individual education programme (IEP) goal is to independently solve addition and subtraction equations using a range of equipment (hundreds chart, calculator, computer, concrete materials).

This mathematics goal is to be achieved in a regular setting alongside peers, with support and adaptation to enable successful learning.

Learning areas

Level 1 mathematics and statistics: Number and Algebra

Tegan learns new mathematics skills supported by the class teacher and specialist teacher in a regular class alongside her peers. Tegan can now count in twos, fives, and tens, an achievement supported through learning about dials. For Tegan, being part of a group fosters social relationships and supports her learning. She is observed to have more interaction with the class teacher when sitting within a group than when she sits in a one-to-one situation with a teacher aide. Tegan is learning mathematics through a planned approach that focuses on specific learning goals. The focus is on learning independently and through interdependence with peers.

Tegan's voice

I asked Tegan what she thinks of mathematics this year. She answered, "Mathematics is sometimes good – sometimes too hard. I like my own work. It's better in a group – it just is".

Mathematics teacher's voice

The mathematics teacher commented to me during lessons that "Tegan is doing very well, she's such a good worker. I'm really pleased with how she's managing herself. Look at her poster. She can read dials now".

Parent voice

Tegan's mother looked at the photos in this string and commented, "I love seeing photos of her working like that. She is so happy and settled with the secure routine – you know – just working with everyone else".

Where to next?

We will encourage Tegan to work alongside her peers in all classes.

The support staff will facilitate social interaction between all students in the class.

We will assist Tegan to engage in group learning tasks where they are meaningful and purposeful, and encourage interdependence.

We will teach to Tegan's individual strengths and needs; it is fine for Tegan to do modified versions of class activities as adapted by the specialist teacher, and we will value progress in these.

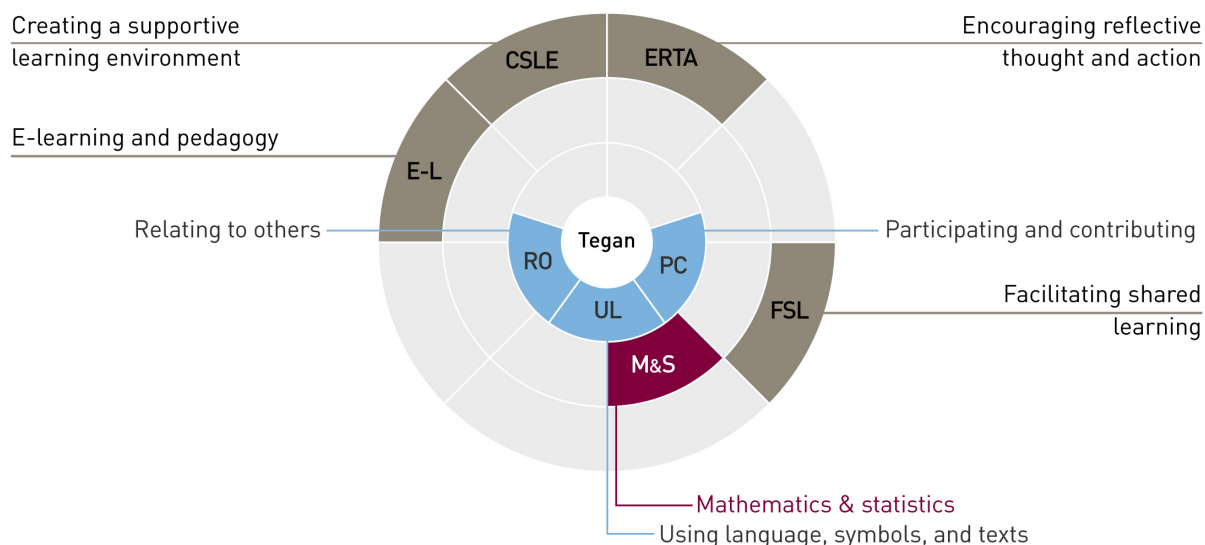
Following the mathematics class on 20 June 2008, I discussed with the mathematics teacher the value of the mathematics software and we agreed that it will be made available for other students to use; Tegan can demonstrate the software to her peers.

Future individual education programme goal

A future IEP goal for Tegan will be to be involved in setting social and learning goals for mathematics, and to know that her voice and preferences are valued.

Another goal will be to introduce a written number problem each day for Tegan to interpret and solve. We will encourage peer interaction to complete this task.

Reflection – what these stories exemplify



Key competencies

Tegan demonstrated successful interactions with her peers in mathematics classes. Relationships were mutually supportive and interdependence supported learning for all students (relating to others).

These stories demonstrated Tegan's active involvement with a partner, with a group, and as part of a regular class. She was a valued class member, was aware of the needs of others, was helpful, and was happy to share (participating and contributing).

Tegan demonstrated the ability to use a variety of language symbols. She was reading dials and using a hundreds chart, a calculator, and computer software in mathematics. These skills supported her to successfully access more complex aspects of the curriculum. Tegan became an increasingly competent user of language – written, aural, and oral, enhanced by the fact that she was such a motivated communicator (using language, symbols, and texts).

How might these stories strengthen Tegan's identity as a learner?

Tegan is actively involved in her learning, is keen to take ownership of tasks and to participate fully with her peers. Learning outcomes are enhanced by meaningful process (e.g. practise reading dials). Tegan's need to know the next step in her learning helps to retain focus and direction (agency).

Tegan's ability to participate, contribute, and relate to others has increased significantly during the first half of this year as she has had more opportunity to interact with peers in structured learning situations, with less adult support (breadth).

The increased levels of interaction and independence are demonstrated across mathematics topics, with different peers and with a range of expectations about task difficulty (continuity and depth).

For more information on the four dimensions of agency, breadth, continuity, and depth (ABCDs), refer to *Narrative assessment: a guide for teachers*.

Learning areas

Level 1 mathematics and statistics

Tegan's learning is in number, level 1 of the mathematics and statistics learning area. It relates to numeracy knowledge stage 4, where a student is able to skip-count, forwards and backwards, in the range 0 to 100 for twos, fives, and tens. This of course in turn aids addition and subtraction skills.

Effective pedagogy

What does this tell us about teaching and learning in this setting?

These mathematics stories provide useful insights into effective teaching in relation to Tegan's learning. A supportive learning environment provides opportunities for Tegan to develop positive social relationships with peers. A school culture is fostered where all students are valued, diversity is celebrated, and individual strengths and needs are respected.

By focusing teaching on meeting Tegan's goals alongside her peers, Tegan is becoming increasingly independent and successful in her classes.

Tegan is encouraged to appraise her own work. She is usually able to find something positive as is demonstrated in her sharing of the mathematics poster. This process encourages reflective thought and supports independent learning.

Tegan's personal laptop is of invaluable support for teaching and learning. As a motivating tool, software supports teaching through the consolidation of skills and concepts. Tegan frequently uses her computer in mathematics, and social opportunities are created when peers join her. The class teacher supports this interaction (e-learning and pedagogy). Tegan wears headphones when using her computer. If Tegan is stressed, headphones block out noise, reduce confusing sensory input, and allow her to focus on her class work.

The teacher encourages interaction between Tegan and her peers. Being part of a group fosters social interaction and facilitates shared learning.

Reflective questions for the reader

"How do you demonstrate you truly value student voice in the process of planning?"

"How do you encourage positive peer interactions?"

"How do you support the transition from primary to secondary school for the child, the school, and the family?"

"How can you best use e-learning to support inclusive learning opportunities?"

Useful resources

Smith, A. B., Taylor, N. J., & Gollop, M. M. (2000). *Children's voices: research, policy and practice*. Auckland, NZ: Longman.