

**Presenter's notes reSolve: Mathematics by Inquiry Professional Learning
Module 3: Including all students in mathematics learning experiences**

Note: This version is suitable for groups of teacher participants of any levels. It is assumed that presenters will select from the resources the relevant tasks for discussion. The notes are written for presenters who are leading either face to face or online groups. The resources for the module include:

- the document “Helpful hints for leaders of teachers professional learning session”
- these notes
- the session slide show
- a suggested abbreviated version of the slide show that can be printed 3 slides to the page for note taking (for face to face groups)
- an online evaluation of the module.

For the session, participants will need:

- The slide show handout
- A computer to access the online survey
- A set of the algebra relationship cards

These notes and the background readings are written to support the delivery of the slide show presentation. Presenters are encourage to read all aspects of the notes and readings.

It assumed that the module will run for two hours. For shorter sessions, the number of tasks can be reduced or it can be split into two halves.

4 Critical actions in delivering the reSolve Professional Learning modules

Prioritise dialog between teachers and between the teachers and you. The goal is to engage teachers in reflecting on their past and future practice in the light of any theoretical insights or suggestions presented. Limit your own opinions.

It is critical to have ways of projecting teachers' responses, especially to any tasks. When teachers are working on or discussing tasks, observe their work and select examples that can help you make your point. It is common for teachers to make rough notes rather than giving complete solutions, but projecting work samples changes this quickly. Using their actual work also has the effect of valuing the input of participants as well as modelling that this is important for them in their teaching.

Determine a process for forming groups and gathering feedback from group discussions that are inclusive and manageable. One suggestion is for groups to assign the members a unique number. The presenter can then call on, number 2, for example, to report on the group discussions. Emphasise that their role is to report on the group discussion, not just their own contribution. The advantage of such strategies is that sessions are not dominated by a few individuals but are inclusive of everyone.

Work though all of the session resources beforehand, anticipating responses that the teachers might give, especially those that address how students might respond.

Outline of the module

Fundamental to part 2 of the resolve Protocol is that the classroom resources be accessible by all students. This module examines the issue of dealing with differences and suggests some strategies that teachers can use in their teaching.

The goals of the module include that participating teachers will:

- Consider the nature of difference and the challenging of including all students in the learning
- Using project tasks,
 - discuss the potential in building learning on a common experience
 - examine how tasks with low floors and high ceiling can offer appropriate challenge to all students
 - explore the nature and potential of enabling prompts to support students experiencing difficulty and
 - explore the nature and potential of extending prompts for those who are ready
- Apply these approaches to other project tasks
- Consider ways that such strategies can be part of planning, interacting with students, and reviewing their work.

Please note that the final part is possibly the most important so it is important to ensure that you move through the other parts allowing enough time to cover this part.

It assumed that the module will run for two hours. Presenters who have less time can select from the tasks included in the module or break the module into two parts of one hour each.

Some background on inclusion

Fundamental to system, school and classroom decisions on maximising opportunity is the potential of education to create opportunity for citizens that they might not otherwise have. The commitment of government through its various agencies is unambiguous, as evident in the overarching Shape Paper (ACARA, 2012) that established the principles for the Australian Curriculum (AC):

All Australian governments have committed to the goals of the Melbourne Declaration, which are that Australian schooling promotes equity and excellence; and that all young Australians become successful learners, confident and creative individuals, and active and informed citizens. (p. 5)

The Shape Paper went further to argue that schooling and the curriculum should ensure that young people,

have a sense of self-worth, self-awareness and personal identity that enables them to manage their emotional, mental, spiritual and physical wellbeing. (p.8)

This, in turn, is intended to prepare them for their,

potential life roles as family, community and workforce members, [so they will be able to] embrace opportunities, make rational and informed decisions about their own lives and accept responsibility for their own actions. (p.9)

This is even described as an *entitlement*,

of each student to knowledge, skills and understandings that provide a foundation for successful and lifelong learning and participation in the Australian community. (p.10)

The document also makes the explicit assumption,

that each student can learn and the needs of every student are important. It enables high expectations to be set for each student as teachers account for the current levels of learning of individual students and the different rates at which students develop. (p.10)

Similar sentiments are expressed in the principles for mathematics (ACARA, 2009):

Building on the draft National Declaration on Educational Goals for Young Australians, a fundamental aim of the mathematics curriculum is to educate students to be active, thinking citizens, interpreting the world mathematically, and using mathematics to help form their predictions and decisions about personal and financial priorities. Mathematics also enables and enriches study and practice in many other disciplines. (p. 5)

It also argues,

that schooling should create opportunities for every student. There are two aspects to this. One is the need to ensure that options for every student are preserved as long as possible, given the obvious critical importance of mathematics achievement in providing access to further study and employment and in developing numerate citizens. (p. 10)

In other words, documents which can be taken to represent community aspirations, argue that all students have an entitlement to a curriculum that maximises their opportunities, that prepares them for a life in which creativity, imagination and an orientation to life-long learning are emphasised more than correct answers, compliant attitudes and acceptance of a designated place in a hierarchical social order. The assumption is that mathematics classrooms should be structured to facilitate the achievement of the curriculum goals for all students.

References

ACARA (2012). The shape of the Australian Curriculum. Accessed Jan 2012 from http://www.acara.edu.au/verve/_resources/The_Shape_of_the_Australian_Curriculum_V3.pdf

ACARA (2009). Shape of the Australian Curriculum: Mathematics. Downloaded in Feb 2012 from http://www.acara.edu.au/verve/_resources/Australian_Curriculum_-_Maths.pdf

Additional readings

It is recommended that you read two sections from

Sullivan, P. (2011). *Teaching mathematics: Using research informed strategies*. Australian Education Review 59. Australian Council for Educational Research.

The review can be downloaded from:

<http://research.acer.edu.au/aer/13/>

The first reading is from Section 5 which summarises 6 principles for teaching mathematics. The key section relates to Principle 4, which says:

Interact with students while they engage in the experiences, encourage students to interact with each other, including asking and answering questions, and specifically plan to support students who need it and challenge those who are ready.

The second reading is from Section 7. The summary of that section is as follows:

Differences in readiness within most Australia classes are significant. In its principles for the development of the Australian curriculum, ACARA (2010b) noted that the top 10 per cent of students are typically five years ahead of the bottom 10 per cent. This situation is a world-wide occurrence, with, for instance, the Cockcroft report (1984) describing a seven-year range in achievement in Year 9 classes in the United Kingdom. Planning for and managing this difference in readiness is the biggest challenge for teachers in all schools.

Mathematics teachers, arguably more than most teachers, find in every lesson that they must address the challenge that some students learn the current content quickly, while others require substantial support. ... This section will analyse the nature of the challenge of teaching classes with a potential knowledge range of at least five school years, first by critiquing the common approach of dealing with differences in readiness through grouping students into like ability groups. This review paper will then outline an alternative approach to dealing with the student differences in knowledge, that of building an effective classroom community, and by differentiating the demand of tasks.