

CHAPTER 2

Beliefs About Teaching and Learning

First Steps in Mathematics is underpinned, or supported, by a number of beliefs about effective teaching and learning.

The Explicit Statement of Long-Term Mathematics Outcomes Improves Clarity of Focus

Learning is improved if the whole-school community has a shared understanding of the mathematics outcomes, and a commitment to achieving them. A common understanding of these long-term outcomes helps individuals and groups of teachers decide how best to aid students' learning, and how to tell when this has happened.

All Students Can Learn Mathematics to the Best of Their Ability

A commitment to common outcomes signals a belief that all students can be successful learners of mathematics. A situation where less is expected of and achieved by certain groups of students is not acceptable. School systems, schools and teachers are all responsible for ensuring that each student has access to the learning conditions he or she requires to achieve the outcomes to the best of his or her ability.

Learning Mathematics Is an Active and Productive Process

Learning is not simply about the transfer of knowledge from one person to another. Rather, students need to construct their own mathematical knowledge in their own way and at a pace that enables them to make sense of the mathematical situations and ideas they encounter. A developmental learning approach is based on this notion of learning. It recognises that not all students learn in the same way, through the same processes, or at the same rate.

Common Outcomes Do Not Imply Common Curriculum

The explicit statement of the outcomes expected for all students help teachers to make decisions about the curriculum. However, the outcomes are not a curriculum. If all students are to succeed to the best of their ability on commonly agreed outcomes, different curricula will not only be possible, but also be necessary. Teachers must decide what curriculum is needed for their students to achieve the outcomes.

A curriculum that enables all students to learn must allow for different starting points and pathways to learning so that students are not left out or behind.

Darling-Hammond, 1994, p. 480

Professional Judgment Is Central in Teaching

It is the responsibility of teachers to provide all students with the conditions necessary for them to achieve the outcomes. This responsibility requires teachers to make continual professional judgments about what to teach, to whom, and how.

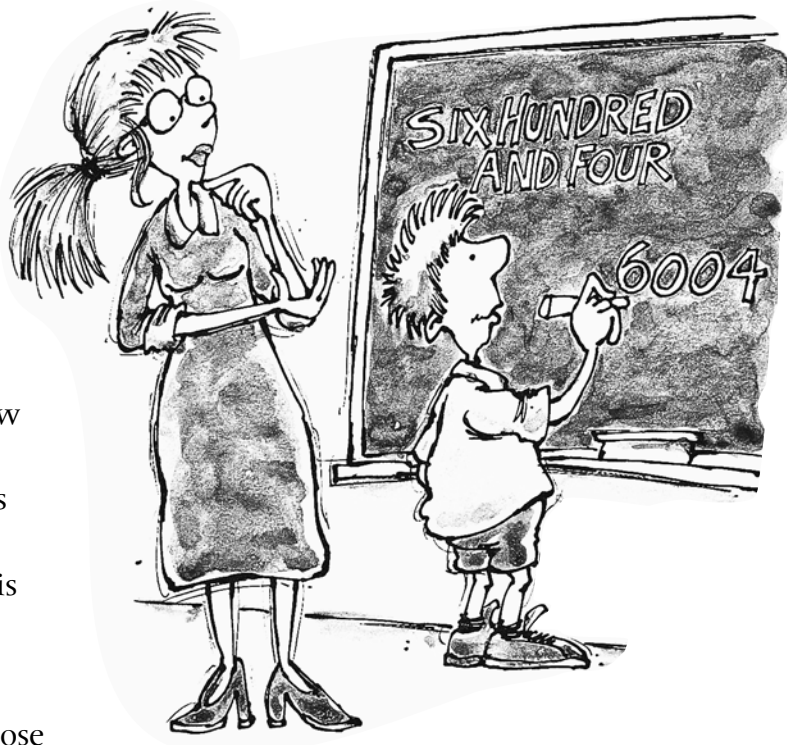
The personal nature of each student's learning means that the decisions teachers make are often 'non-routine', and the reasoning processes involved can be complex. These processes cannot be reduced to a set of instructions about what to do in any given situation. Teachers must have the freedom and encouragement to adapt existing curricula flexibly to their students' needs. The improvement of students' learning is most likely to take place when teachers have good information on which to base their professional judgments.

'Risk' Relates to Future Mathematics Learning

Risk cannot always be linked directly to students' current achievement. Rather, it refers to the likelihood that their future mathematical progress is 'at risk'.

Some students who can answer questions correctly might not have the depth of understanding needed for ongoing progress. Others might have misconceptions that could also put their future learning 'at risk'. A number of students may make errors that are common when they try to make sense of new mathematical ideas and, therefore, show progress. For example, a student who writes six hundred and four as '6004' is incorrect. However, this answer signals progress because the student is using his or her knowledge of the fact that the hundreds are written with two zeros.

Students who are learning slowly, or whose previous experiences are atypical, might nevertheless progress steadily if their stage of learning is accommodated with appropriate, but challenging, learning experiences.



Successful Mathematics Learning Is Robust Learning

Robust learning, which focuses on students' achieving the mathematics outcomes fully and in depth, is essential if learning is to be sustained over the long term.

A focus on short-term performance or procedural knowledge at the expense of robust knowledge places students 'at risk' of not continuing to progress throughout the years of schooling.