

3.2 Develop expert learners: Foster deep understanding and skilful action



Essence >
The teacher helps students build rich conceptual knowledge and mastery of complex skills.

Key actions: Teachers

- Develop my own deep understanding of the concepts I teach
- Design activities that lead students to grasp concepts and deepen their understanding
- Devote time and effort to helping my students grapple with the concepts, and get them to explain concepts to each other to ensure deep understanding
- Pose open questions with no right or wrong answers, to evoke students' emotions, imagination, reflection, action and research from a range of sources and perspectives
- Teach students explicit strategies for higher order thinking, and structure tasks where they choose strategies to investigate issues, develop their understanding, refine their skills and communicate what they've learnt
- Encourage self-testing
- Ask students to determine what level of practice they need to develop mastery and automaticity
- Model self-reflection, critical thinking, creative imagination and questioning of my own assumptions
- Guide students in searching for patterns and relationships to interpret information and experience
- Emphasise the power of precision in language
- Incorporate reflection and targeted formative assessment to ensure rigorous learning
- Use strategies to help learners connect new knowledge to their own prior experience, other disciplines and the world beyond the classroom
- Value students' input and commit quality time for them to discuss, share knowledge, explain their thinking, question assumptions and refine their understanding
- Guide and support learners to achieve a level of mastery that enables them to experience empowerment and intrinsic satisfaction
- Use models and illustrative stories to engage the imagination of students
- Engage students in working with authentic problems and issues

Key actions: Students

- Use thinking strategies that I've been taught, to help me understand better
- Talk about learning with others, share feedback, explain things and help solve problems
- Work together to fire questions and challenge our thinking, without being right or wrong
- Make the most of all the technologies I can use for learning
- Ask myself: 'Where am I heading?', 'What else might I need to know?', and 'How could I do it in another way?'
- Never give up, be proud of my efforts, and know for myself when I've really 'got it'
- Ask questions when I don't understand
- Seek feedback on how I could improve my skills
- Ask myself: 'Do I need to practise this more to feel really sure I can do it?'



The role of the educator is not to put knowledge where knowledge does not exist but rather to lead the mind's eye that it might see for itself.

Plato

Justice alert

Have I made sure *every student* has developed the important understandings and mastery of the skills?

Ways to foster deep understanding and skilful action

Use learning and teaching models: Use learning and teaching models to design learning for deep understanding and skilful action (eg Integral Learning Model, 5Es, Format, ESL Teaching Cycle).

Develop higher order thinking skills: Explicitly coach students in the use of question frameworks such as Bloom's Taxonomy, Question Matrix, 3 Storey Intellect, and SOLO. Record students' questions and teach them how to identify links.

Question wall: Students display questions that they think might be answered during a topic. Discuss the types with students—open, closed, speculative, divergent, clarifying, essential—and how they will need different strategies and lead to different reactions/forms of information. Draw up lists of generic questions to use for certain types of tasks (eg scientific investigation). Refer to and extend these question groups regularly.

Use precise language: Model and teach the language constructs for specific disciplines of learning, so that students are skilled in using language most appropriate for specific tasks (eg a film review needs different language from a data analysis report).

Exposition writing: Students use exposition writing to analyse differing perspectives and extract their own deep meaning.

Mu dictionary: Using this technique, students can express meaning in four different 'ways of knowing':

- Propositional**—'How can I describe/define this?'
- Factual**—'Some examples are ...'
- Personal**—'What's this got to do with my life?'
- Conceptual**—'Can I express this as an image or illustration?'

Deepest understanding emerges from the integration of these four 'ways of knowing'.

The teacher can develop a mu dictionary of definitions of concepts to clarify what he/she wants the students to know and be able to do.

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Earthquakes shake up a classroom

We had the Smartboard ready and the students were keen to explore our new Geographic Information System (GIS). They could add data to maps to change visual representations and investigate issues.

I used their latest interest. 'Look at the screensaver earthquake pictures. We must have some experts in our midst. Does every place in the world have earthquakes?' I asked.

This very first question had the students responding. They were diligent, curious and exuberant, all at the same time. I fed their momentum by thinking aloud: 'I wonder why some areas have more earthquakes than others?'. There were plenty of experts eager to share their knowledge in response.

'There are these tectonic plates,' said one student. 'I think they've got something to do with it.'

It was time for the interactive searches. We added 'tectonic plates' to our map and predicted where earthquakes might happen. The students came to the screen and pointed to particular parts of the map. Some added extra pieces of information that they thought might be useful to our quest.

We added the 'earthquake' data. Our predictions were very close. That was great feedback! Then the excitement changed to puzzlement. Suddenly, the students saw one area with a huge number of earthquakes, and they were worried. There was real concern that it wouldn't be safe to live there or even visit there. Discussion was intense. I posed the question, 'Do you think that all of the earthquakes happen at the same time?'

Now the students were weighing up visual data with personal reasoning. They were seeing the whole concept growing by the minute. Their minds were in overload, yet turbo-charged. They didn't look like giving up.

I posed more questions: 'Would all earthquakes be the same size? How do they measure how big an earthquake is?'

It was back to the students. One told us about seismographs. He'd seen one at the science centre; he drew a zigzagging earthquake graph on the board. I showed the class how to organise the data to see when earthquakes occurred and how big they might be.

The students devoured the avalanche of data. Their enthusiasm showed in the self-questioning, the sharing of knowledge and the new learning. They were pushing themselves. The GIS data and instant feedback had resulted in deep learning, building on what they knew and wanted to know, generating questions, predictions, explorations and hypotheses, and enabling the students to use data to inform their next steps.

The use of raw data led the students to identify patterns and it supported and demanded scientific thinking. Students were pushed into complex thinking and new understandings that could be harnessed next time we used data.

There was a time that I would have just told them the 'answer'. But I've learnt the power of tapping into their questions and how 'interest' takes them deeper and deeper into the learning.

Primary teacher

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3.2

