Understanding learning and teaching

How Students Learn
Compiled by Margaret Buckridge

Susan Toohey identifies the following steps in her simple model (1999) of the process of learning:

- Encounter, or be introduced to, the idea
- Find out more about it
- Try it out
- Get feedback
- Reflect, adjust and try it out again.

This model works beautifully if we think about ‘life’ learning – learning to talk, to walk, to ride a bicycle, etc. One of the reasons why it works so well is that the feedback is intrinsic, that is to say, you will know immediately from the consequences of your attempt whether or not you have succeeded in learning. You know immediately if people don’t understand you or if you have fallen off your bike.

The model is more complicated when we come to academic or educational learning, mainly because academic learning does not usually provide intrinsic feedback. We may think that we have done something well (an assignment, for example) yet receive a low mark and criticism for it. We need this extrinsic feedback because ‘trying out’ doing the assignment does not come with immediate consequences – unlike ‘trying out’ the bike. Although there are exceptions to this, much educational learning is dependent on help with knowing how we are doing.

In other words, although we need feedback even more with educational learning than with life learning, it is less immediately available, and there may be quite a long time between ‘trying it out’ and getting the feedback and having a chance to ‘try it out’ again.

Toohey suggests that what goes wrong with the model in universities is that we spend too much time and energy on the first two stages (with lectures, on-line content, reading lists, etc) and too little time and energy on the three crucial stages that follow.

Another lens

John Bain (1991), suggests that classrooms need to have a couple of different dynamics at work if students are to learn effectively.

The first of these is the dynamic of practice. To learn something deeply, to become familiar with it, we need to practice it – to say it out loud, to deploy it in different contexts, to play with it.

The second is the dynamic of challenge. To advance our knowledge, to deepen it further, we need to practise it, to interact with in ways that challenge our understanding.
Promoting a Deep Approach, Discouraging a Surface Approach

(Compiled by Dr Carol Bowie)

Approaches taken by students to their learning can be characterised as surface and deep.

**Surface Approaches** to learning are characterised by:
- Focusing on the details and parts of the information in an atomistic way;
- Memorising individual details in the form they were given;
- Listing things as they were presented.

**Surface Approaches** to learning are encouraged by:
- Assessment methods emphasising recall or unconceptualised procedural knowledge;
- Assessment methods that create anxiety;
- Cynical or conflicting messages about rewards;
- An excessive amount of material in the curriculum;
- Poor or no feedback on progress;
- Lack of independence in studying;
- Lack of interest and background knowledge in the subject matter.

**Learning Outcomes** resulting from surface approaches to learning are characterised by:
- A limited understanding of concepts;
- Being less able to distinguish principles from examples;
- Difficulties in developing a logical argument;
- Difficulties in recognising which ideas are key ideas;
- Facts being forgotten very quickly (within the week).


**Deep Approaches** to learning are characterised by:
- Focusing on the overall meaning of the material;
- Processing information in an holistic way;
- Interpreting the material meaningfully;
- Integrating content into pre-existing knowledge.

**Deep Approaches** to learning are encouraged by:
- Methods that foster active and long term engagement with learning;
- Stimulating and considerate teaching;
- Clearly stated academic expectations;
- Appropriate and timely feedback;
- Opportunities to exercise responsible choice in the method and content of study;
- Interest in and background knowledge in the subject matter.

**Learning Outcomes** from deep approaches to learning are characterised by:
- The development of “rational” responses to tasks;
- Long-term retention of understanding;
- The ability to apply knowledge to novel situations;
- The ability to generate new meaning, new paradigms;
- The development of independent, self-directed learning.

Teaching Approaches to Encourage Deep Learning

Teaching that encourages students to develop a deep approach to learning has the following characteristics. It:

**Supports Independent Learning:**
Learning needs to be self-rewarding, but can be ONLY IF the environment is set up in a safe, non-threatening way; Explicitly teach learning strategies so that students can begin to:

- develop self-directed learning;
- become more competent at learning; and thereby
- reduce anxiety about failures; while
- increasing successes.

**Organises Appropriate Learning Activities:**
Students need to be active, not passive, in their learning experiences. However, merely *doing* is not sufficient for learning; the learning activity must be planned, reflected upon, processed and related to the learning outcomes.

**Encourages Interaction with Others:**
It’s often easier (and more rewarding) to learn with others than alone.

**Uses Appropriate Assessment Practices that:**
- reward deep learning; and
- inform students in advance of the criteria and standards required of them.

Helping Students Move from Surface to Deep Learning

Research into student learning has shown that there are five broad “levels” or “categories” of understanding that underlie most students’ work. For example, Biggs and Collis (1982) used the SOLO Taxonomy, a useful way to describe how students can develop their approaches to learning and move from a surface to a deep approach if teaching and assessment practices are structured appropriately. The term “SOLO” stands for Structure of the Observed Learning Outcome.

The five “levels” and their descriptors, as they become evident in student assessment items, are:

- **Prestuctural**
  - No knowledge about the topic is apparent in student work.
- **Unistructural**
  - The student shows some understanding of at least one aspect of the topic.
- **Multistructural**
  - The student grasps a number of ideas about the topic, but does not relate them to one another, or to the central question, and the information is presented descriptively, or in list form.
- **Relational**
  - Here the student relates all the significant aspects of the topic to one another, and brings them together to form a coherent point of view so that the work can stand as a whole.
- **Extended Abstract**
  - Now the student brings all the significant aspects of the topic together, and takes them further by extending their application into other domains, hypothesising about related issues, or reflecting on their own actions and understanding.

References and further reading:
Questioning

Strategies for Effective Questioning

1. **Ask one question at a time** – do not confuse students by asking a question that is too complicated. For example, “can you explain how the principles of classical rhetoric were manifested in the rhetoric used by world leaders during the war with Iraq and what the likely implications of the use of rhetoric will be for future leaders, giving some examples to illustrate your main points?” Students are more likely to respond to 3 or 4 shorter questions.

2. **Avoid yes/no questions (closed)** – closed questions such as “Is this your first experience of university teaching?” will not generate discussion.

3. **Ask questions that have more than one possible answer** – This stimulates critical thinking. For example: responses to “when” and “where” questions are generally “closed”, but responses to “how” and “why” questions are generally “open”.

4. **Ask focused questions** – be specific when you ask a question. In a laboratory context you would need to ask procedural questions like “how long will you need to heat this for?”, prompting questions like, “Have you thought about…?” and probing questions like “what do you predict will happen?”

5. **Avoid asking questions that are biased to your viewpoint** – Biased questions are the ones that “lead” students to your own perspective and hinder their own intellectual growth. For example, “why are some leaders more persuasive than others?” would have had quite a different effect on students' answers if it had read, “Don’t you all agree that the rhetoric we heard during the war with Iraq was so obviously based on faulty premises that it failed to persuade anyone?”

6. **Give students time to think before asking them to respond** – do not panic if your students do not answer straight away. You might consider giving students the chance to write down a response first, or discuss it with their neighbour.

7. **Ask questions requiring students to show understanding** - do not simply ask, “do you have any questions”, rather ask “What questions do you have about the principles of classical rhetoric?”

8. **Use questions to change the pace and direction of the discussion** – About 15mins is the maximum attention span for students in a lecture or tutorial so you need to have a way to refocus them. For example, “From all the discussion we’ve just had, Karen, Can you summarise the most important points?”

9. **Use probing strategies** – probing strategies help students to extend their understanding of what they already know. For example, “Well, Sharon, you’ve identified why some leaders are more persuasive than others, but what are you basing your opinions on?”

Managing Students’ Questions

1. **Ask students to prepare their questions before the class and come with them written down** – This gives students a chance to think things through carefully beforehand.

2. **Listen to the student’s questions** – don’t interrupt them while they’re speaking.

3. **Test group’s agreement/disagreement with answers** – if the first student to respond gives a really good answer, call on a couple other students to see whether they agree or disagree with the first response and ask them “WHY?”

4. **Use non-verbal gestures to indicate your attention** – look at your students and nod to show you understand what they are saying.

5. **Acknowledge interesting questions and answers** – saying things like “good question” and thanks for asking that” will reinforce that you welcome questions but don’t overdo it.

6. **Be fair in taking questions and answers** - take questions in order, and let students know they will all get a turn (if time permits).

7. **Structure question for interaction between students** – ask students to relate their own question to ones that were raised earlier by someone else. For example, “Bill, you heard the issues that Mary...”
raised about Tony Blair’s use of rhetorical strategies earlier. How do Mary’s concerns relate to yours?”

8. **Involve “shy” or reserved students** – try to frame questions in a way that allows students speculate rather than stipulates that there is a correct answer.

9. **Put emphasis on the answer not on the student who gave it** - directly telling a student they are wrong will only embarrass them, try saying “Well, no, Steven, that’s not exactly the answer I was looking for. Can you help out with this, Kylie?”

10. **Indicate whether certain questions will be covered in a later class or are better dealt with after class** – some students ask questions that are important, but are not really relevant to the topic under discussion. It’s best to defer them to another time.

11. **Move around the room to include students to discussion** – If you stay in one area of the classroom you risk alienating students on the other side of the room.