

# Reading 9

## Education for all

Anita Craig

Craig starts her article by introducing what she believes to be the basic principles involved in cognitive change among adolescent and young adult learners. You will notice that she draws strongly from both Piaget and Vygotsky in her attempt to understand how **university** students learn and, therefore, how university teachers should structure their teaching in order to enable the best learning.

Although Craig's writing does address a higher education learning problem, you should notice that it has great relevance to all levels of learning and teaching. You will have met a number of these ideas and concepts – like the learning paradox, or the role of conflict in learning, or how one uses the familiar and unfamiliar in learning – before.

Use the knowledge you have already learnt to understand the new points Craig makes, like the different ways in which teachers can manipulate either **form** or **content** in order to move learners from the unknown to the known. Note, also, that she is particularly concerned to get learners to understand what she calls the **epistemic rules** of subjects or disciplines. This is a very important kind of learning at university but, in many ways, it is similar to what other articles have called 'principled' learning.

If you find you are struggling with this article, you might want to revise some previous readings like those of Bennett and Dunne, Vygotsky, Piaget, or Maybin *et al.*

### Notes

## Reading Basic principles for cognitive change

Please note that the text in this subsection (Principle 1) has been adapted from the original.

### ***Principle 1: Manipulate form and/or content to create conflict***

In the absence of *conflict* – between what learners know and can do, and the content and cognitive operations required and the [epistemic] rules which define the task – *knowledge and thinking remain static*. [In order to create movement we need to create cognitive conflict in a learning situation.]

Conflict can be thought of, and varied, in terms of both *form* and *content*.

It is important to note that the move from familiar content and familiar form towards *unfamiliar form and unfamiliar content* can occur by manipulating both simultaneously, or either independently. Here are two examples:

- *Familiar content and unfamiliar form*. An example of this would be learning to *theorize* the *family*. In this case *theorizing* would be an *unfamiliar form* but the *family* would be content that is *familiar* to most learners.
- *Unfamiliar content and familiar form*. An example of this would be memorizing the facts about an unknown topic. While the *content* here is *unfamiliar* (the facts about nuclear fusion, for example, are unknown) the *form of learning – memorization – is familiar* to most learners.

We could summarize these different combinations as follows:

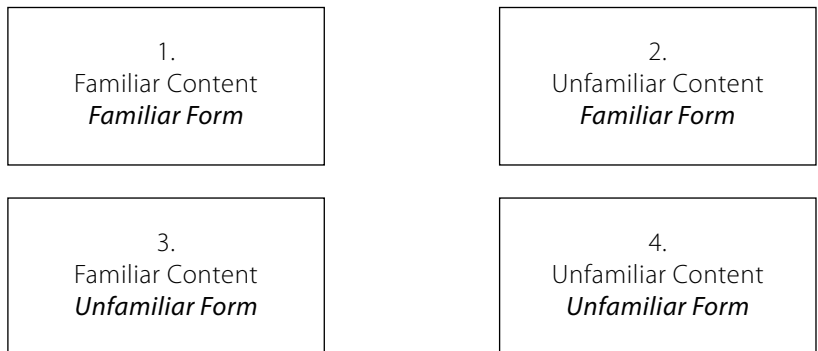


Figure 1: Learning-teaching positions.

How can we make use of the four possible *learning-teaching* positions in our teaching? Let us begin by looking at separate examples of familiar and unfamiliar form and content.

- In South Africa, power struggles between opposing political parties was *familiar content* for black South Africans in the late 1980s.
- However, discussions about ‘inner’ conscious and especially uncon-

scious states – important understandings in the discipline of psychology – was *unfamiliar content* among many black students.

- *Memorizing* a set of facts or *narrating chronological events* – rote learning of history at school, for example – was a form of learning or knowing *familiar* to most students.
- However, *theorizing* observations and *taking on different perspectives* on the same event – such as writing an academic essay or doing academic research – was an *unfamiliar form* of learning for most students.

[...] We can combine these to create different *learning-teaching positions* (as indicated in Figure 1). Here are two examples:

- Combining familiar content and unfamiliar form: We could ask learners to theorize (unfamiliar form) 'the family' (familiar content), or write an academic essay (unfamiliar form) on liberation struggles (familiar content).
- Combining unfamiliar content and familiar form: We could ask learners to memorize facts (familiar form) about the unconscious (unfamiliar content).

Each position has its strengths and weaknesses. Generally speaking, it seems that a learning-teaching position in which familiar content and unfamiliar form are combined (in which learners are taught to think and learn in new ways, in other words) makes engagement *more difficult* than a task in which unfamiliar content and familiar form are combined (in which learners are asked to learn new facts in old ways, in other words).

.....

**Learning a new way of thinking (a new form) is usually more difficult than learning new content, as Craig suggests. But teaching students how to learn a new form is one of the most critical tasks we have as teachers. The challenge is to find ways of doing this. One of the implications of Craig's ideas is *not* to load the unfamiliarity of new content on learners when you want them to learn a new form of thinking. Use familiar content to do this. Once they are familiar with the new form, move onto new content.**

## Note

**You will notice, however, that Craig says that if she wants to move learners 'swiftly and efficiently' towards unfamiliar form and content she 'forces' them to grapple with both unfamiliar form and content *but* that she then ensures that she provides strong scaffolding.**

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However, if we need to move learners swiftly and efficiently from what they take for granted or do habitually, towards the unfamiliar form and content of university tasks, I prefer to take students *directly to a task* which embodies both an unfamiliar form and content. It is important to *scaffold* this engagement with *that which they need to do or know* in

order to assist them in their struggle to master the unfamiliarity.

This is a specifically Vygotskian perspective and, as such, deliberately aims at addressing the socio-historical or contextual constraints on education, in general, and the tasks we design for learning, in particular.

### ***Principle 2: To learn, take action!***

For someone to learn, she must first **act**. She does this in order to discover the limits of her knowledge and skills, and the demands of the task, **before** she can be explicitly taught about the task and ways of engaging it appropriately and successfully. Socrates first alluded to this principle when he said [...]:

*'... a person cannot possibly seek what he knows, and, just as impossibly, he cannot seek what he does not know, for what he knows he cannot seek, since he knows it, and what he does not know he cannot seek, because, after all, he does not even know what he is supposed to seek' (quoted in Kierkegaard, 1987, p. 9).*

Action is, therefore, that which enables learners to **seek** that which will turn the unfamiliar into the familiar. In other words, action is that which empowers the learner to overcome the learning paradox.

### ***Principle 3: Design appropriate tasks for learning***

Teachers must design tasks that will elicit learning. These tasks can be described as **appropriate occasions for actions**. Tasks must be selected and designed on the basis of ongoing analyses by teachers of:

- ***What learners can do and know.*** This will include both what is positive (learner attributes that are consistent with the task at hand) and negative (attributes and understandings that are at odds with the task at hand).
- ***The nature of the task that has to be completed and how it changes.*** Teachers need to consider what content and cognitive operations the task requires and the (epistemic) rules which define the task.
- ***What suitable strategies and/or materials are needed to bridge or scaffold between learner and task.***

The tasks chosen as occasions for learning become the focus for further (and ongoing) analyses. The three facets outlined on page 92 should be considered constantly as education programmes are planned and replanned.

### ***Principle 4: Designing appropriate assessment***

Testing must **track** the learners' increasing ability to engage successfully with the tasks. This testing could be thought of in terms of the following three-fold focus:

Principle 3 may, on its own, seem a little obscure. You may ask, 'But what must I do?' Read this section of the article in relation to what has come before and what follows. If you do this you may be able to 'fill in' the 'missing' content.

- *Do learners retain the content?* Frequent multiple-choice tests on lectures or texts could be used.
- *Do learners understand the appropriate form instructions?* Short tasks focusing on the (epistemic) rules and (cognitive) operations which constitute the task could be used to assess this.
- *Do the learners develop a familiarity with both content and form?* Essay-tests and homework assignments which combine both the typical content and form of the subject, or topic, or discipline being taught could be used to assess this.

The *gap* between *learners' performance* and the *task* becomes, then, the source of data for further analyses and the redesign of the education programmes. [It provides information about learners' actual learning and their potential for more learning.]

This means, at best, that the results of tests are not only data for and about the learners, but also data for the teachers about their teaching intervention. Learners' performance on tasks should be used to revisit, again and again, the conception and design of learning-teaching tasks so that we promote efficient, independent, and successful problem-solving abilities.

### **Principle 5: The importance of scaffolding**

A problem inherent in most education settings during times of rapid change [...] is that educators want to retain and even improve the best of what they have achieved in the past while also doing something positive about the failure of certain groups of learners. [...] This places a formidable burden on educators because they have to do **two** things simultaneously:

- teach the 'traditional' students whatever they think their particular course is about and do so at the different levels of study;
- do something *in addition* to this for those who do not fit into the 'traditional' patterns of what learning and teaching at university level (apparently) entail. [...]

The principles as outlined so far [...] will help us to teach so that learners will learn. But we must also consider what will *scaffold learners* in such a way that they are enabled to *act* in order to overcome the unfamiliarity posed by new tasks and strange demands. I call this 'consolidation work'.

Consolidation work isn't merely another name for 'skills tutorials' (such as essay writing, note taking etc.). Consolidation work should '*consolidate*' learning. [...] This involves:

- showing learners the (cognitive) operations required given the (epistemic) nature of the task; or
- exposing the rules which constitute the task and which demand certain operations.

How do teachers do this?

This could be achieved through *modelling mental processes*. In other words, by showing *how* one must *operate* to engage the task appropriately and successfully. Teachers would show learners what 100% task execution would 'look' like, for instance. I think that this work is best done through *materials* which scaffold learners' task engagement. [...]

## The importance of conflict in learning

Every schoolboy knows that people don't shift from 'where they are at' to another way of thinking and/or acting unless their habitual ways prove unsuccessful, or in some or other way not 'good enough' anymore. In the most basic sense this is what Piaget meant when he said that in the absence of conflict, knowledge remains static. [...] Understanding *the power of conflict* in the process of change is also, at least implicitly, part of the door-to-door salesman's arsenal aimed at getting someone to buy something new.

The point is, the role of conflict in changing people's habitual ways of acting is firmly part of a whole host of practices and systems of ideas. Starting from a position of familiarity – both in terms of content and form – does *not* afford either the learner or the teacher the opportunity for learning and teaching.

Perhaps this is also the reason why so many educational programmes encounter *additional problems*, for example, motivation. A learner in a position of familiarity has *no reason to shift* or to learn. So the teacher will most certainly encounter the (additional) problem of a lack of motivation.

If, however, there is a *gap* between what the learner *can* do and does know and what she *needs to do* but *doesn't* know, overcoming the gap constitutes that which is motivating. It creates a *conflict* in the learner. [...]

## The relationship between form and content

All people are, obviously, in a position of familiarity (in terms of both form and content) when they do things they know well and engage in habitually. Getting from this position to a situation where they encounter a new or unfamiliar situation means that they must shift from a position of familiarity to one of unfamiliarity.

When they overcome the unfamiliar (both in terms of form and content) we say they 'have learnt' (or have been 'taught').

But both 'learn(t)' and 'taught' are 'names for problems'. [...] In other

words, these words don't inform us about what *actually happens* or *generates* the shift! In trying to understand learning processes, we encounter the work of Piaget, Vygotsky, Luria, and many more who attempt to theorize these almost magical processes. [...]

So, how do we learn?

Pascual-Leone (Pascual-Leone and Goodman, 1979) makes a distinction between what we could call our 'structural mental capacity' and our 'functional mental capacity'. The first involves our *given, innate mental power* (the size of our engines, so to speak) whereas 'functional mental capacity' refers to the *ways we have learnt to 'use our engines'*. In other words, our functional mental capacity is that *with which we mobilize our innate, human capacities*.

This distinction goes to the heart of the capacity and ability to know, to learn, and to adapt to new situations.

Our *structural* mental capacities are, therefore, those with which we are born. They are capacities which develop through different stages and ages until some kind of plateau is reached around about puberty or young adulthood. After this the only 'development' we usually look forward to is what we term 'wisdom'.

In contrast, our *functional* abilities involve knowing how to 'use our heads'. In other words, our functional abilities are those with which we *mobilize* our given capacities. Learning to 'use our heads' is something which we learn in a great many ways from birth onwards: from our parents and others, through and from the ways they relate to us, and from our 'environments' in both general and specific terms.

Individual and group differences (Khoisan children, for example, learn to 'track' game while kids from the cities now learn to 'surf the net') illustrate the different ways in which we learn to 'use our heads'. Also, a child who grows up in an enriched and stimulating environment learns *how to learn and know*. This is often utterly impossible and out of reach for a child from a different, perhaps parentless, hungry, and lonely situation on the streets.

The point is, whatever our human mental capacities, these rely on learning, development, and explicit teaching in order to be available for performance.

At a very basic level human beings may, therefore, be distinguished from other animals on this very score. Humans *need extensive education* to develop those abilities which will allow them to function effectively and successfully in any particular situation. And this is probably why we have invented schools and other formal settings where we teach our young *out of context* what to know and do in order to fit into a modern, schooled society. [...]

Education may, therefore, be thought of as that process which exploits our *structural mental capacities* and equips us with the necessary *functional abilities* to perform at a level, and in a manner appropriate for, our age and other aspects of our lives. A gap between the two is, therefore, not only normal but also *necessary* for learning. [...]

Do you notice the influence of Vygotsky in these ideas? If you don't, you may want to reread Vygotsky in Section One.

## Acting to learn

Maybin *et al.* talk of a continuum between procedural knowledge and principled knowledge (page 61). How similar is Strohm-Kitchener's thinking?

Strohm-Kitchener (1983) divides knowing into three levels:

- the basic cognitive operations such as memory or first-level cognition;
- second-level cognition or metacognition (knowing about knowing);
- epistemic cognition or the rules of tasks.

I think this provides us with a useful set of pointers with which to think about learning-teaching. **Acting to learn** must involve action at all these different levels of the task. [...]

As such, designing a task which will elicit action means doing so with these three levels in mind.

- 'Learning' the content of a task (what it is about) involves at a most basic level, first-level cognition.
- **Working** with this content (transforming it through bringing different perspectives, evidence, and arguments to bear on the content), involves higher-order cognitive operations such as metacognition and the manipulation of the (epistemic) rules which constitute a task.

The question is, however, how do learners learn about task demands (except by struggling to interpret their course-work marks and lecturers' comments on these)?

We have introduced the notion of form instructions, as well as the idea of varying the familiarity-unfamiliarity of the form and content in order to shift the learner to learn the above.

## Teaching for learning

What we have not yet addressed is learning-teaching. In other words, we haven't discussed **how and when and why** to apply certain operations or rules or conventions. This brings us to learning **about learning** and knowing **about knowing**, or **metacognition**. This is necessary in order to **learn how, when, and why** to control first-level and third-level (epistemic) cognition for successful task engagement.

We said above that action is that which enables learners to look for that which will turn the unfamiliar into the familiar. [...] Imagine, for example, giving students a brief definition and discussion of abortion, accompanied with a relatively bland list of the advantages and disadvantages of choosing to abort a foetus. Imagine furthermore, asking them to **'critically discuss'** abortion.

If students are underprepared for university studies, you could expect, at least, the following patterns in their responses:

- a repeat or restatement of the text as given, without any attempt to work with the information given or the text as is;



- a tirade against (or for) abortion using personal conviction (or religious injunction) as the basis for their tirade, often without any reference back to the information given.

Both these violate the form-instruction (by this we mean the instruction to 'critically discuss'). Rectifying this demands that students **know about knowing** or **learn about learning**. In other words, teachers must intervene at a metacognitive level so that learners are enabled to manipulate the content and (epistemic) rules/conventions through which a task is constituted. [We want learners to change the form in which they respond. We want them to discuss the matter in an academic manner. For this reason we need to teach in a way that enables **learners to realize** – to know – that the form in which they are currently operating is inappropriate and why it is inappropriate.]

In this example, this will entail involving learners in tasks through which they could learn to:

- **Distance themselves**, or cognitively remove their operations, from their own experiences and beliefs. This can be done through engaging repeatedly in tasks which demand that they argue for a position **contrary** to that which they naturally hold on issues.
- **Argue** logically and reasonably for a certain position, probably this contrary position.
- **Use (empirical) evidence** to back up their claims and to integrate claims and evidence into a coherent 'story'.
- Appreciate the **force of conventions**. In other words, learners need to understand what counts (or is accepted) as 'logical argument' or 'evidence' within academic discourse.
- Follow **the rules** which govern the kind of problem-solving situation at hand. For instance, learners need to learn to discern whether the problem is open-ended or closed.

Involving learners in tasks through which to learn the above once again demands that the teacher proceeds according to the principles for cognitive change as outlined in this paper.

Plainly, we cannot put learners in a classroom, pen and paper in hand, and tell them, 'you have to distance'; 'you have to ...' etc. Learners just do not learn that which they cannot do in this way!

They have to be (gently) 'trapped' or 'tricked' into tasks which will 'force' them to **act** so that they can acknowledge that which they **do know and can do** and, also, that these may not take them far enough! This is a sign of thinking metacognitively. [...]

If I am right about these basic principles for cognitive change (and only ongoing empirical scrutiny of them could prove or disprove this), then following them should just about describe what it means to **teach for learning**:

- creating and engaging the conflict between what is known and can be done, and the demands of an unfamiliar task;

- eliciting action to empower learners to overcome the unfamiliar;
- grasping occasions for learning through scaffolding between learner and task;
- testing in order to track learning-teaching;
- teaching through acknowledging and manipulating the gap between what a learner knows and does spontaneously, and that which demands new operations.