



# THE CONSTRUCTION OF KNOWLEDGE

THE KEY PEDAGOGICAL STRATEGIES FOR ALL TEACHERS ARE INSTRUCTIVISM AND CONSTRUCTIVISM, BUT WHAT ARE THEY, AND WHY SHOULD WE CHOOSE ONE OR THE OTHER?

SANJNA VIJ HAS SOME ANSWERS.

At opposite ends of the educational theory spectrum, instructivism – or direct instruction – involves the teacher-directed delivery of a planned curriculum, with the teacher making the decisions about the content and sequence of the learning, while constructivism sees the teacher step back to allow a student-directed, discovery-based approach to learning, with the student making the decisions, with guidance from their teacher, about the next steps in their learning as they develop their knowledge and skills.

Constructivism proposes that students learn best as they make sense of the world, with the teacher as a guide to help them along the way. India's National Curriculum Framework 2005 requires that teachers have an in-depth knowledge of constructivist approaches. According to the National Curriculum Framework, 'Constructing meaning is learning.... Learners actively construct their own knowledge by connecting new ideas to

existing ideas on the basis of materials/ activities presented to them (experience).'

So what is the constructivist view of learning, what are the characteristics of a constructivist classroom and what kinds of behaviour can you expect to observe in it?

The shift from a teacher-centred instructivist to a learner-centred instructive approach demands a change in our teaching and in the way we reflect on our teaching practice.

Whether we realise it or not, in our teaching all of us have operated as constructivists in some way, but the educational thinkers who described the constructivist approach are Jean Piaget and John Dewey. According to Dewey, knowledge and skill develops only in situations in which learners have meaningful experiences. From a specifically psychological and child development perspective, Piaget explains that the basis of learning is discovery. As he puts it in *To Understand is*

*to Invent*, 'To understand is to discover, or reconstruct by rediscovery, and such conditions must be complied with if in the future individuals are to be formed who are capable of production and creativity and not simply repetition.'

As a result of observation and scientific study about how people learn, constructivist theory explains that we construct our understanding and knowledge of the world through experience. When we encounter something new, we have to reconcile it with our previous ideas and experiences.

Twomey Fosnot in *Enquiring Teachers, Enquiring Learners* defines constructivism by reference to four principles:

- learning depends on what we already know
- new ideas occur as we adapt and change our old ideas
- learning involves the development of ideas rather than mechanically accumulating facts, and



■ meaningful learning occurs through rethinking old ideas and coming to new conclusions where new ideas conflict with old ideas.

In essence, we all learn by using our experiences, prior knowledge and perceptions within our physical and interpersonal environments to construct knowledge and meaning.

An effective constructivist classroom, then, consists of learner-centred activities in which knowledge is not a thing that can be simply transmitted by the teacher to student but is constructed as the student enquires, explores, questions, debates, applies and reflects upon what they know and can do.

The student in the learner-centred classroom is an active learner, while the teacher facilitates their learning by providing opportunities for learning characterised by active engagement, problem solving, collaboration with others and inquiry.

In the constructivist classroom the teacher as guide directs and facilitates learning. Thus, the teacher's main focus is on asking questions that will guide students to develop their own understanding,

enable them to generate new ideas and understandings, and integrate these into their growing body of knowledge and skill.

### **Scaffolding**

The key roles for teachers as facilitators to support students in constructivist learning environment are:

- modelling
- coaching, and
- scaffolding.

While instructivism and constructivism are at opposite ends of the educational theory spectrum, modelling and coaching both imply actions by the teacher that provide instruction, so the teacher in the constructivist classroom will often be providing models of knowledge and skills. The teacher as guide, as guide implies, is assisting the student as they create their learning journey.

Scaffolding, however, is a more complex teaching behaviour. We all create mental schemas by which to organise, store and recall information.

The broader our schema, the more we are able to learn and the more easily we are able to do so.

As teachers, we inevitably introduce schemas as a plan or a structure that provides students with an organised framework to accommodate knowledge. The point of scaffolding from a constructivist perspective is not to impose our schema on them, since if it is not meaningful for them it is unlikely to be useful, but to assist them in building or extending their own schema by scaffolding around their existing experience and understanding.

### **Schemas and bananas**

When students construct their own schema, drawing on their own experience and understanding, supported by their teacher's experience of and understanding about them as learners, they are more likely to learn.

Consider, for example, the following facts about bananas.

Category: fruit

Type: tropical

Maturation identifiers: skin can be peeled when ripe; colour indicates degrees of ripeness – green is unripe, yellow is ripe, dark brown or black is over ripe; taste indicates degrees of ripeness – starchy and

*As teachers, we must be mindful of our students current schemas that enable them to organise and accommodate their growing conceptual understanding, knowledge and skills.*

bitter is unripe, sweet is ripe, fermented is over ripe; texture indicates degrees of ripeness – hard, firm flesh is unripe, slightly firm flesh that is easy to slice, break or mash is ripe, mushy flesh is over ripe.

If we have never seen or tasted a banana it is unlikely that we will care about or understand these banana facts. As a consequence, we would be unlikely to remember them. In reading the facts, though, you will inadvertently have drawn on your experience of bananas. Your experience of ripe, unripe, or overripe bananas informs your schema and it's this schema that helps you remember the facts.

### **Active co-construction of learning**

The expectation within a constructivist learning environment is that students play an active role in, and take responsibility for, their learning. A key issue, of course, is how we as teachers address a pre-existing curriculum.

Teachers using both instructivist and constructivist approaches inevitably use assessments, formal and informal, to identify where their students are in their learning, and then design learning activities that are appropriate to those learners at the identified particular stages.

For the constructivist teacher, a pre-existing curriculum is a given, but the teaching decisions they take as they provide opportunities for learning characterised by active engagement, problem solving, collaboration with others and inquiry, and as they scaffold their students' learning are inevitably shaped into particular classroom events.

The curriculum, in essence, provides a formalised schema for the teacher, who then particularises it to enable students to adapt from their existing framework of knowledge and skills to accommodate further knowledge and skills.

### **Flexibility**

The constructivist teacher operates flexibly and creatively to incorporate students' predicted schema, experiences and opportune 'teachable moments' as they scaffold

students' construction of knowledge and skills through meaningful understanding.

Constructivist classrooms are characterised by a democratic environment where learning activities are varied, interactive and student centred. They are structured to enable students to engage in hypothesising, active problem solving, meaningful inquiry and action to enable inquiry, imaginative creation, invention and testing, interaction and personal reflection.

The goal of constructivist teachers is to create and maintain a democratic classroom environment that provides meaningful learning experiences for autonomous learners.

In a traditional classroom, an invisible and imposing, at times, impenetrable, barrier between student and teacher exists through power and practice. In a constructivist classroom, by contrast, teacher and student share responsibility and decision making to support active and autonomous learning.

According to Audrey Gray in *Constructivist Teaching and Learning*, in the constructivist classroom:

- students are actively involved
- the environment is democratic
- activities are interactive and student-centred, and
- the teacher facilitates a process of learning in which students are encouraged to be responsible and autonomous.

### **Cooperative learning**

Learning in the constructivist classroom tends to involve students working collaboratively in groups, with an emphasis on social and communication skills, and the exchange of ideas, but this is a typical but not an essential characteristic of the constructivist classroom. Nevertheless, the cooperative approaches typically seen in constructivist classrooms are unlike those found in most instructivist classrooms in which students are typically instructed en masse by their teacher and then work individually on set material.

The experimentation, research, role play, field trips and the like in constructivist

classrooms that provide opportunities for students to build their knowledge and skills through inquiry, imaginative creation, invention and testing, interaction and personal reflection typically invite cooperative approaches. They also mesh neatly with online learning tools such as discussion forums, wikis and blogs.

### Principles of the constructivist approach

Jacqueline Grennon Brooks and Martin Brooks in their book, *In Search of Understanding: The case for constructivist classrooms*, identify several principles underpinning the constructivist approach.

1. Pose genuine problems that are or will be relevant to the students. Questions and activities you develop with and for your students should be of relevance to their current schema and developmental abilities.
2. Structure learning around essential concepts in the curriculum. Students understand and make meaning by breaking wholes into parts. For example, young story writers can approach the concept of telling a story through discovery activities. These might include creating a class library of illustrated storybooks, a visit by a storyteller, discussion of students' schemas addressing concepts and experiences of 'story' and so on. Depending on your students' prior learning, you might introduce narrative sequencing through visuals, provide students with opportunities to rearrange parts of a known story or even digitised video material they have referred to in the past.
3. Be aware that students' points of view are windows into their reasoning. Learning through self-construction may feel threatening for some students, particularly if they have been schooled on a diet of direct instruction, and many students struggle to analyse and articulate that analysis in group discussions. Remember that it might take time for students to articulate their points of view, and that they need different kinds of opportunity to elaborate and explain.

The construction of knowledge calls not only for time to reflect but also time to practise explaining. The many opportunities to explain what they're doing help them understand what they are learning.

4. Adapt the curriculum to match your students' current schema and developmental abilities. Start your preparation by identifying the kinds of activities you predict will most likely be developmentally appropriate for them. Most high-school students, for example, would find the preparation of a film script or a legal brief more engaging and relevant than the report format they mastered in sixth grade. Role plays are also interesting ways for students to present information.
5. Assess student learning in the context of your teaching. The key pedagogical shift is to understand that assessment does not simply measure your students' knowledge and skills, although good assessment certainly does that, but also identifies how much and what kind of help a student needs to be successful. The shift to a constructivist approach depends on reliable assessment. While there remains a place for quantitative assessments that enable teachers to identify students' understanding of concepts and misconception, knowledgeability and gaps in knowledge, and levels of skill, assessments that are open, creative, learner friendly, continuous and comprehensive are a vital part of the constructivist classroom. This is because the key behaviour in such a classroom is the co-construction of knowledge by teacher and student, and it is only through open and detailed assessment that the constructivist teacher can understand the student's progress and ensuing next steps in learning.

### The instructivist and constructivist choice

Our pedagogical choices as teachers range between instructivism and constructivism, and the ways we might decide to proceed at various times, in various situations, for various students and addressing various

aspects of the curriculum will determine whether an instructivist or constructivist approach suits best.

Instructivism and constructivism are exclusive in the sense that if we decide that a direct instruction approach is appropriate at a particular time we will not be maintaining a constructivist classroom, but instructivism and constructivism are not exclusive in the sense that we can only choose one approach as the be all and end all.

The point is that, as teachers, we must be mindful of our students current schemas that enable them to organise and accommodate their growing conceptual understanding, knowledge and skills, and that we make pedagogical choices, instructivist or constructivist, that enable them to build and extending their schema by scaffolding around their existing experience and understanding. **1**

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