10 Activity learning

It is often assumed that learning which involves an activity is low on cognitive development. Nothing could be further from the truth. Indeed, the contrast between action and cognition is a false one: people do not learn from experience alone, but from experience combined with planning and reflecting.

'Activity' is intended here in a very broad sense, and is relevant to every subject area. Two specific types are outlined here,

i) Designing and Making,
ii) Experiments.

There are many other forms of activity learning, in aesthetic subjects, physical education and so on. Indeed, writing is a form of activity, and can be enhanced by regarding it as such. These have their own procedures but many of the issues for observation and evaluation are common across these differences.

Designing and making

This approach to learning through a constructive activity was developed under the rubric of Design and Technology, replacing older forms of craft teaching in which the learner carried out precise instructions and imitated a pre-existing object. The 'designing and making' approach can be applied in many different curriculum areas, for instance in writing, music, drama, creating a website. It can also be applied to many different media, whether cooking, building, tapestry, gardening, or organizing an event.

It can be carried out on an individual basis, with each learner designing and making a separate item, or working in groups to design and make something.

Crucially, the participant is not following a precise set of instructions written by someone else, such as a knitting pattern or a recipe, but is engaged in designing as well as making. The difference involves not just cognitive development but issues of citizenship: are young people being socialized by school into obeying orders or to become participants in a democracy?

The Design and Technology approach consists of four stages:

- identifying needs and opportunities
- generating a design
- planning and making
- evaluating.

Identifying needs and opportunities involves not only investigating what people need, but also a critical look at products or tools they currently have and examining the context.

Generating a design is a creative process, but that doesn't mean inventing something from nothing. It also involved looking at existing good designs. Nor does that mean simply the appearance, but also the inner structures of an object. (It can involve 'de-construction' of existing artefacts.)

This four stage process can be applied with modification to other school subjects. For instance, writing should involve identifying what the text is intended for, planning (partly based on good models), writing, and evaluating (often involving returning to stage 3 to improve on a first draft).

The process can also be a collective one, rather than a solo work; and the product can be a socially useful one (e.g. a children's playground, equipment for an old people's home). Rather than a 'product', it could be an event. For example, one school set a Design and Technology challenge each year, such as planning a room for a new baby, or planning a rail journey to London (including games, food, etc.)

It involves a complexity of cognitive and ethical and aesthetic issues:

- resolving technical problems inherent in the materials being used, or contradictions between design, materials and purpose, or between functionality and aesthetics
- imagining different futures
- weighing up alternative designs before choosing the most suitable (based on which criteria?)

This provides another clear demonstration that it is the combination of theory and practice, not the activity alone, which leads to quality learning.

Experiments

Experiments should never start with the doing. In an experiment, you check if your hypotheses about a sequence of events and the connections between different causal factors are confirmed or negated.

Typically, experiments are designed so that most factors are kept constant with only one variable input having a visible or measurable influence on the outcome. The messiness of real world events is simplified in a partial or modified simulation of the process.

In school experiments, complex phenomena are often presented in an artificially simplified way so that the sequence of events can be observed precisely and reliably, though not falsified.

In a traditional school experiment, pupils are actively engaged in the doing but not the designing. However, there are benefits, in terms of developing scientific thinking and an understanding of method, for pupils to be given the opportunity to design experiments themselves, perhaps as optional variants on the version proposed by the teacher.

Research in various countries has shown a tendency for young people to hold onto their prior 'common sense' models of how the world works even when this is contradicted by the science they have learnt: we somehow hold the two in parallel in our minds. A good way to prevent this is to bring the 'common sense' assumptions out into the open by inviting pupils to make predictions. This is an important way of encouraging thoughtful participation in experiments. For the same reason, reflective and critical evaluation involving the articulation of models and theories is important after an experiment.

Experiments can also be conducted in other fields, for example in social studies to explore people's reactions to events, in media studies, in geography. Virtual experiments of many kinds using ICT can simulate and trial events which are otherwise difficult to carry out in real experiments.

Issues for observation and evaluation

A Is the purpose of the activity clearly explained but without giving away too much of the conclusion? Is it sufficiently open to pupils' thoughtful use of initiative?

B What is the relationship between doing and thinking? Are pupils fully involved in both aspects?

C What skills are developed, e.g. drawing designs, craft skills, musical performance, precise measurement?

D If the activity is carried out individually or in small groups, how is a common purpose, a learning community, established? Are pupils motivated by a sense of product or audience?

E How are pupils developed through this activity learning: e.g. cognitively, socially, aesthetically?