2.4: Cognitivism

Figure 2.4.1 Benjamin Bloom Image: Wikipedia
2.4.1 What is cognitivism?

An obvious criticism of behaviourism is that it treats humans as a black box, where inputs into the black box, and outputs from the black box, are known and measurable, but what goes on inside the black box is ignored or not considered of interest. However, humans have the ability for conscious thought, decision-making, emotions, and the ability to express ideas through social discourse, all of which are highly significant for learning. Thus we will likely get a better understanding of learning if we try to find out what goes on inside the black box.

Cognitivists therefore have focused on identifying mental processes – internal and conscious representations of the world – that they consider are essential for human learning. Fontana (1981) summarises the cognitive approach to learning as follows:

‘The cognitive approach … holds that if we are to understand learning we cannot confine ourselves to observable behaviour, but must also concern ourselves with the learner’s ability mentally to re-organize his psychological field (i.e. his inner world of concepts, memories, etc.) in response to experience. This latter approach therefore lays stress not only on the environment, but upon the way in which the individual interprets and tries to make sense of the environment. It sees the individual not as the somewhat mechanical product of his environment, but as an active agent in the learning process, deliberately trying to process and categorize the stream of information fed into him by the external world.’ (p. 148)

Thus the search for rules, principles or relationships in processing new information, and the search for meaning and consistency in reconciling new information with previous knowledge, are key concepts in cognitive psychology. Cognitive psychology is concerned with identifying and describing mental processes that affect learning, thinking and behaviour, and the conditions that influence those mental processes.

2.4.2 Cognitivist learning theory

The most widely used theories of cognitivism in education are based on Bloom’s taxonomies of learning objectives (Bloom et al., 1956), which are related to the development of different kinds of learning skills, or ways of learning. Bloom and his colleagues claimed that there are three important domains of learning:

- cognitive (thinking)
- affective (feeling)
- psycho-motor (doing).

Cognitivism focuses on the ‘thinking’ domain. In more recent years, Anderson and Krathwohl (2000) have slightly modified Bloom et al.’s original taxonomy, adding ‘creating’ new knowledge:
Bloom et al. also argued that there is a hierarchy of learning, meaning that learners need to progress through each of the levels, from remembering through to evaluating/creating. As psychologists delve deeper into each of these cognitive activities to understand the underlying mental processes, it becomes an increasingly reductionist exercise (see Figure 2.4.3 below).

### 2.4.3 Applications of cognitivist learning theory

Cognitive approaches to learning, with a focus on comprehension, abstraction, analysis, synthesis, generalization, evaluation, decision-making, problem-solving and creative thinking, seem to fit much better with higher education than behaviourism, but even in school/k-12 education, a cognitivist approach would mean for instance focusing on teaching learners how to learn, on developing stronger or new mental processes for future learning, and on developing deeper
and constantly changing understanding of concepts and ideas.

Cognitive approaches to learning cover a very wide range. At the objectivist end, cognitivists consider basic mental processes to be genetic or hard-wired, but can be programmed or modified by external factors, such as new experiences. Early cognitivists in particular were interested in the concept of mind as computer, and more recently brain research has led to a search for linking cognition to the development and reinforcement of neural networks in the brain.

In terms of practice, this concept of mind as computer has led to several technology-based developments in teaching, including:

- **intelligent tutoring systems**, a more refined version of teaching machines, based on breaking down learning into a series of manageable steps, and analysing learners' responses to direct them to the most appropriate next step. Adaptive learning is the latest extension of such developments;
- **artificial intelligence**, which seeks to represent in computer software the mental processes used in human learning (which of course if successful would result in computers replacing many human activities – such as teaching, if learning is considered in an objectivist framework);
- **pre-determined learning outcomes**, based on an analysis and development of different kinds of cognitive activities, such as comprehension, analysis, synthesis, and evaluation;
- **problem-based learning**, based on an analysis of the thinking processes successful problem-solvers use to solve problems;
- **instructional design** approaches that attempt to manage the design of teaching to ensure successful achievement of pre-determined learning outcomes or objectives.

Cognitivists have increased our understanding of how humans process and make sense of new information, how we access, interpret, integrate, process, organize and manage knowledge, and have given us a better understanding of the conditions that affect learners' mental states.

**References**


Atherton J. S. (2013) *Learning and Teaching; Bloom’s taxonomy*, retrieved 7 May 2019


**Activity 2.4 Defining the limits of cognitivism**

1. What areas of knowledge do you think would be best ‘taught’ or learned through a cognitivist approach?

2. What areas of knowledge do you think would NOT be appropriately taught through a cognitivist approach?

3. What are your reasons?