

Piaget's theory on cognitive development

Piaget believed that children were born with an innate desire (and need) to adapt to their environment, and that they do this by interacting with it and learning from it. He came up with the idea of 'schemas' which are the basic building blocks of intelligence. Babies start out with minimal in-built schemas for things such as sucking and grasping and moving limbs. As the baby grows its schemas are refined and combined to create more complex schemas such as for walking. This development takes place through the processes of 'assimilation', 'accommodation' and 'equilibrium'. A baby will try and apply its schema of sucking its mother's nipple to obtain nutrients to sucking a cup of juice; this is the baby's attempt to assimilate the task of drinking from a cup into its existing schemata. The sucking schema is inadequate for the task and the child will be in a state of disequilibrium. In order to restore balance the child must modify its existing schemas to accommodate the new task or experience. This is the process of 'adaptation'.

Piaget identified four main stages of cognitive development through which all children pass as they grow older. Each stage is typified by the kind of schemas a child has within that stage. The intellectual understanding attained at each stage builds upon that of the previous stage, and the stages are therefore passed through in sequence. Development remains continuous and fluid through all the stages however, rather than jumping from one stage to the next.

The first stage is called the sensorimotor stage. This stage occupies approximately the first two years of the child's life. It is characterised by the child's hands-on approach to discovering the world around it. The child learns by hearing, seeing, smelling (sensory) and grasping, sucking and pulling (motor). The first few months are also characterised by the baby's lack of 'object permanence'. This means that the child is not able to understand that when an object is removed from view the object still exists. To the child, if an object is out of sight it is out of mind. The child is also extremely egocentric; it is unable to make the distinction between itself and the world around it.

The second stage in Piaget's theory of cognitive development is the preoperational stage which lasts from the ages of 2 to 7 years old. During this stage the child greatly develops the ability to use symbols and language. Although the child learns to distinguish between itself and the rest of the world it is still egocentric in that it is unable to see things from other people's point of view or to 'put itself in other people's shoes'.

The next stage is called the concrete operational stage which last from 7 to 11 years of age. This stage is where the child acquires the ability to perform logical operations. These cognitive operations allow the child to make logical deductions which are not dependant on their perceptions although they still need a grounding in concrete experience. These logical operations are also fully reversible allowing the child to consider a great deal of possibilities. The child also becomes a great deal less egocentric, allowing it to become a lot more sociable and consider various points of view.

The fourth and final stage is the formal operational stage which develops from the age of 11 to the age of 16. During this stage the child's ability to perform logical operations continues to grow and is freed from the need for actual experience of the object or situation. This enables the child to think in more abstract terms allowing them to consider hypothetical situations as well as real experiences. The child also becomes capable of 'reflective abstraction' which allows them to acquire new knowledge by considering and reflecting upon existing knowledge.

One of the first criticisms of Piaget's work is that he often only used his own three children as test subjects for his experiments. This could introduce several confounding variables and problems with the validity of the results.

First of all the use of only three participants for any kind of experiment is too small, especially when the results are to be applied to the whole world. Any kind of anomalies or unusual traits of his three children would be magnified. For instance, if one of his children was able to perform a particular mental operation at a very young age, this could be interpreted as meaning a third of the whole world's children would be able to do the same, even though only a tiny proportion actually could.

Piaget's theory, however, has been criticised for underestimating infants. Bower shows that if an object disappeared behind a screen, and a screen was lifted, babies at the age of five months will show surprise if the object was not there.

Furthermore, Hughes criticised Piaget's preoperational stage of testing. He said that the three mountain task did not resemble a child's everyday experiences, so he conducted the hiding from the policeman task, which was more realistic.

Piaget was also criticised for demand characteristics. Testing the concrete operational stage, he used the same question after transformation, this for the child implies a different response where the answer is still the same. This makes the child behave in a predictable way.

Another weakness is for his methodology, during the concrete operational stage he deliberately transformed the display, making the child's response affected. So Donaldson made the transformation accidental so the child focuses on the actual transformation. The source of making this accidental was a teddy bear, which in fact distracted the children.

Another criticism was that if a child is not biologically ready to move onto the next stage, then practice should not make a difference, however Bryant trained children under seven to cope with using mental rules.

In spite of these weaknesses, Piaget's approach and theory should not be overlooked. He produced the first comprehensive theory of children development. It has also generated research and is used in educational practice.

Applications to education

Applying Piaget theory of cognitive development to education, he claimed that children do not need to be taught. They learn because they are drawn into experiences. If a child has brought something prematurely that they could have discovered for themselves, this prevents them from ever completely understanding it. It is a child centred approach.

The first outcome of Piaget theory for educational practice is the view that children learn by constructing their own knowledge when placed in normal situations. The teacher should provide materials and questions which moderately challenge current skimmers, leading to disequilibrium, accommodation and construction of new skimmers. The teacher does not make the discrepancies explicit, but stand back and allow the children to work it out for him or herself. This educational method is called discovery learning because this theory is constructivist in which they suggest that knowledge is constructed individually.

One major strength of Piaget's approach in education, is that it has had an enormous influence on education in the UK. The Plowden report, recommended that primary education should move from being teacher led to being child-centred and justified this in terms of Piaget's view that learning is only truly successful when the tyre invented for him or herself.

One criticism of Piaget's approach in education is the fact that his research of than they had to explore alternative explanations for observed phenomena means that his insight into cognitive development is flawed. For example, in the object permanence experiments. He failed to exclude the possibility that babies know the object still exists but simply can't do anything about it.

Also many fear that discovery activities in the classroom may actually reduce real learning because the reduced time there can be spent on content learning related to the basics (reading and writing). In addition, judging a child's stage of maturation may be beyond most teachers in terms of time available, as well as skill.

However Vygotsky suggested that the desire to learn is an outcome of learning rather than being a prerequisite for learning. Because he also felt that expert guidance is needed to move the child through the zone of proximal development, and that without active intervention that child learns less.