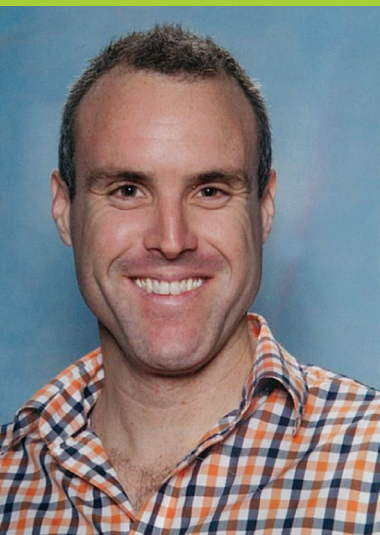


PART 2

STUDENT LEARNING



TEACHER CASE STUDY

Teacher: Chris Lukins

Number of years teaching: 7

Year level(s) teaching now: Years 9 and 12

Subjects you teach: English, History, Society and Culture

What drew you to teaching and what keeps you there?

Teaching was never a career I actively pursued. I fell into it after completing a Bachelor of Arts degree in History and, after discovering the limited practical applications for this qualification in the workforce, I decided to complete a Diploma of Education. The benefit of this was that it allowed me to continue to engage in History, an interest and a passion, in my daily work. The continuous desire to perfect my practice and extend the depth of my knowledge in my subject keep me going.

What do you find to be the most enjoyable part of teaching?

You build a rapport with students, particularly senior students, that is rewarding. As you become aware of the personal background of some students you realise that school is often a place of security and even refuge for them. It is a nice feeling knowing that, through building relationships in which they feel accepted, you contribute in some small way. I also enjoy it when students develop an affinity for my subject and this can be the catalyst for thinking more broadly about the world in a critical way.

What do you wish you'd known when you started out that you know now?

I wish I knew how time-consuming it would be. I started teaching thinking that the limited school hours and the abundance of holidays would mean I would have a great deal of time to pursue my own interests. But to do a decent job you really need to invest a lot of time to things like reading, marking, creating resources, and that's all before you start taking on extra-curricular duties.

You probably started out your career with some assumptions about how students learn. What were these assumptions? Have these assumptions changed and, if so, how have they changed?

Arrogantly, I thought that students learned the way I did – the teacher taught and you listened and learned. I didn't know how difficult it would be to create and sustain student engagement. For so



many of my students education isn't valued anywhere near as highly as I had assumed, particularly compared to their burgeoning social lives. Students begin to learn when they feel engaged and connected. Finding strategies that allow this to happen is something I constantly strive for.

What motivated you to learn when you were at school? How do you motivate your students to learn?

I was fairly unmotivated for the early part of high school, except for the odd topic in History or English that grabbed my attention for whatever reason. It was a realisation, partly through teacher encouragement, that I was actually capable of doing well, along with the hope of performing well in my HSC that got me motivated. Getting students motivated is a constant struggle. Trying to get them to see real world applications of what they are learning, getting them to see the relevance of education more broadly, and trying to pick the most interesting topics are general tactics to motivate them. You also need a vast array of teaching strategies that allow students of varying abilities to access what you are teaching because often a lack of motivation can stem from a perception of difficulty.

How do learning environments affect students' ability to learn?

We are constantly reminded at our school of the research that talks about the importance of the learning environment. Factors such as the absence of disruptive students and the predictability and consistency of behaviour consequences are definitely important to fostering this. It's also very important to create an environment where students are encouraged to make mistakes through attempting the work themselves. Often students value the 'right' answer more highly than they do the process of thinking about an answer. If you create a supportive learning environment it can help students overcome this.

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CHAPTER 2

How students develop and learn

● INTRODUCTION

'Human development' is a complex term, but for our purposes it can be defined as the changes that occur in humans between conception and death. Studies in human development typically focus on chronological changes in the physical, personal, social, cognitive and moral domains. These changes are judged to be for the better as they allow us to become more adaptive and flexible, hence the term 'development' is used.

Psychologists such as Piaget (1928), Vygotsky (1978), Erikson (1950) and Kohlberg (1966) used 'stage' theories to explain the different 'stages' we go through as we evolve and grow, physically, mentally and emotionally. These theories normally point to a final maturity stage.

While stage theories are helpful in explaining human development there are still problems in generalising these across genders and cultures. As a case in point, the circumstances and medical conditions of Aboriginal children can be major impediments to their development. For example, Zubrick et al.'s (2008) study noted that suboptimal foetal growth among Aboriginal children was high (20% compared with 13% for the total population); and that 24% of Aboriginal children were at high risk for significant emotional or behavioural difficulties. Consequently, there is not the same likelihood that these children will develop along the stages proposed by the developmental theorists for Western cultures.

Further, the attention in most of these stage theories to intra-individual change can often lead to insufficient attention being given to interpersonal and social forces.

Also, life events can vary enormously between individuals. Disruptive life events such as a best friend moving interstate or overseas, death of a grandparent, or separation or divorce of parents can often lead to periods of instability and transition. We need to be mindful of the extent we assume that stages are predictable and relatively stable.



Source: Alice McBroom. Pearson Australia.

● HUMAN DEVELOPMENT THEORIES AS THEY HAVE EVOLVED OVER TIME

McInerney (2014) reminds us that there should be a strong link between educational psychology theorising and teaching-learning processes. '[B]est practice in classrooms, whether it is at the primary, secondary or tertiary level of education, should reflect what the best theorising and research has to offer' (p. 3). This depends, however, on the context and the time period. The learning worlds of today, with their emphasis upon digital technology and the internet, are very different to the learning worlds of several decades ago. Figure 2.1 provides an overview of the four major strands of theory that were prevalent in the 1950s and 1960s. It is worth noting that, while some concepts and approaches declined in popularity, others have adapted and evolved and are still in use today.

Cognitive psychology's rise to prominence was due to the work of Piaget (1896–1980), Vygotsky (1896–1934), Gagne (1965), Ausubel (1961) and Bruner (1966). The cognitive emphasis on learning has continued to grow as a result of recent concepts such as metacognition and constructivist approaches being adopted.

Behavioural psychology also peaked during the 1960s as a result of the implementation of behavioural objectives, the use of praise and punishment and programmed learning. Behaviourism's influence can still be seen in direct instruction approaches but it has diminished considerably.

Social cognitive psychology with its emphasis on the effects of modelling has largely disappeared apart from studies on self-efficacy and self-regulation.

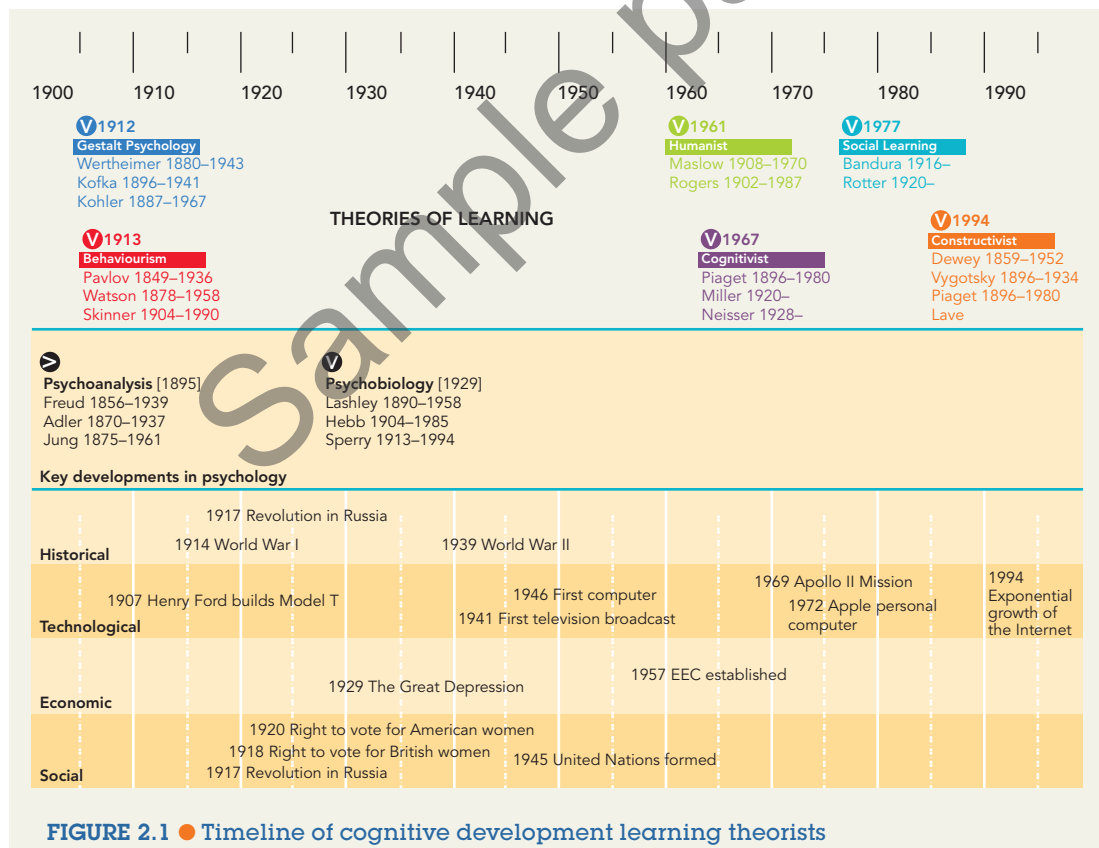


FIGURE 2.1 ● Timeline of cognitive development learning theorists

Source: Ashworth, Brennan, Egan, Hamilton & Sáenz (2004). © Frank Ashworth, Gabriel Brennan, Kathy Egan, Ron Hamilton and Olalla Saenz.

TABLE 2.1 ● Leading cognitive development theories

Theory	Leading theorists	Construct of theory	Recent related constructs	Application of this theory
Cognitive	Piaget (1954) Vygotsky (1934) Ausubel (1961) Gagne (1965) Bruner (1966)	Transfer of learning Role of prior knowledge	Meta-cognition Learning styles Cognitive styles Experts & novices	Direct instruction Information processing Discovery learning Concept learning Problem solving
Related socio-cultural constructivism theory and research	Vygotsky (1934) Piaget (1954) Bandura (1997)	Development's influence on cognition Social influence on learning Learning situated in physical and social contexts	Metacognition Zones of proximal development Private speech Socially mediated learning	Co-operative learning Assisted learning Scaffolded learning Peer modelling Self-efficacy
Social, emotional and moral development	Erikson (1950) Kohlberg (1966)	Development of identity and moral values	Identity Morality Self in transition Resiliency and coping	Discussion of adult roles Activities that develop independence Scenarios of moral dilemmas

Source: Clarke & Parada (2012). Reproduced with permission.

Humanism, as popularised by Rogers (1969) and Maslow (1943), was widely discussed in the 1980s and seen as an antidote to other more mechanistic approaches to learning and teaching. Their humanistic approach focused on personal change and growth.

In present times it is evident, according to McInerney (2005), that cognitive psychology has come to dominate psychology theorising. However, there has been a merging of emphasis including constructivism and behaviourism within a cognitive framework as illustrated in Table 2.1.

Discovery learning continues to be a focus, especially with regard to inquiry learning in some subjects. Behaviourally based approaches now include a cognitive element and, as McInerney (2005) argues, Piaget's theory continues to be important, although proponents have now focused upon personal or cognitive constructivism rather than the structuralist elements of his cognitive stages. Vygotsky's (1934) theory, which can be considered as social constructivism, has led in turn to much interest in constructivist approaches to learning and to cooperative learning. Moral development theories and especially the influences of Kohlberg (1966) have focused attention on values learning.

● HOW TEACHERS USE THESE THEORIES

Pre-service teachers need to understand and be able to apply principles of child development. As noted by McDevitt et al. (2013), teachers must 'engage in developmentally appropriate practice ... adapted to the age, characteristics and developmental progress of individual children' (p. 24).

Although several major developmental theories will be analysed in this chapter, it is also important to remember that, while these theories organise and give meaning to facts and make predictions

about changes in children's behaviour over time, they also typically account for only some of that behaviour.

As noted by O'Donnell et al. (2012), science in the 21st century continues to broaden our understanding of learning theory (p. 239). Glassman and Wang (2004) remind us that developmental theories are dynamic and dependent on use. The way in which we might use a particular theory depends upon how we interpret it and use it as a tool in the classroom.

Teachers have the opportunity to observe first-hand how individual students develop and the nature of their present developmental tasks. Observation of students' work habits, manual dexterity skills and small group behaviour can be very revealing for the teacher as it can reveal how students cope with their school work such as assessment tasks and how they interact with peers. (For example, see the *Checklist: Observing individual students*.)



CHECKLIST



Observing individual students

When you undertake your professional experience in schools see if you can answer these questions.

- Have I started an individual record of behaviour for each student who misbehaves?
- Do I know each student's general school achievement?
- What are their specific achievement needs in terms of skills?
- What have been some significant aspects of social behaviour for each student?
- Which students have physical disabilities?
- Which students have emotional difficulties?
- Which students need particular help in social adjustment?

Source: Based on Byers & Irish (1961).

● THEORIES OF COGNITIVE DEVELOPMENT

Piaget

Jean Piaget (1896–1980) was the major pioneer of cognitive theory (Berger, 2006; Heaven, 2001). Piaget believed there is a biological inevitability to how children develop. He undertook an intensive observation of individual children (especially his own children) and by this *clinical* method established his theoretical principles.

He used the term 'schema' to demonstrate how children actively construct their world. A schema is a concept or framework that exists in an individual's mind to organise and interpret information (Santrock, 2010).

Piaget contended that there are two processes responsible for how children use and adapt their schemata: 'assimilation' and 'accommodation'. Assimilation occurs when a child incorporates new knowledge into existing knowledge. Accommodation occurs when a child adjusts to new information (Santrock, 2010). That is, assimilation involves adjusting the environment into a schema, whereas accommodation is adjusting a schema to the environment.

Piaget also used the term 'cognitive equilibrium' to explain why children use the processes of assimilation and accommodation. Cognitive equilibrium is a state of mental balance. When a child has a new experience that does not fit into his or her existing understanding, then a state of 'cognitive

‘disequilibrium’ occurs. Initially this produces confusion, but it eventually leads to cognitive growth (Berger, 2006).

As Piaget’s theory is focused on children’s actions, what might this mean in terms of the teacher’s role? Is the application of this theory suitable for teachers of adolescent students?

Piaget saw cognitive or intellectual development as having four stages:

- 1 Sensori-motor (0–2 years)
- 2 Pre-operational (2–7 years)
- 3 Concrete operational (7–11 years)
- 4 Formal operational (11 years and above).

He considered that every individual passed through these four stages in the same order, although there would be variations in the ages associated with each stage. It should be noted that an individual does not end one stage suddenly and commence another. Rather, there is a gradual merging from one to another (see Figure 2.2).

1 *Sensori-motor stage (0–2 years)*

Infants experience the environment as a result of their senses and from their body movements (Adolph & Berger, 2006). At the end of this stage they can solve simple problems in their heads.

2 *Pre-operational stage (2–7 years)*

Piaget considered that this stage represents a quantum leap because children start to use symbols. They make something stand for something else. Language becomes increasingly important in developing their symbols. For example, a child is shown a picture of a family sitting under a sun umbrella at the beach (symbol). The child at the pre-operational stage uses language to talk about events that take place at the beach such as putting up the sun umbrella, playing in the sand and swimming in the water.

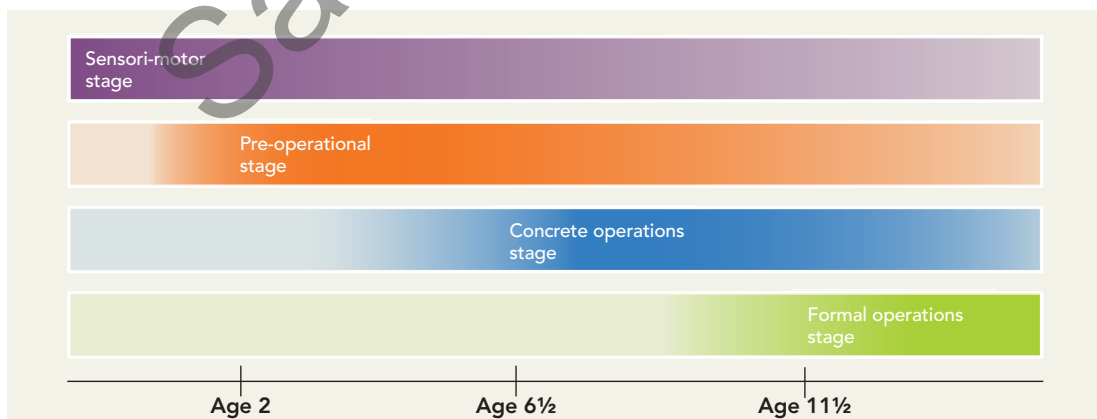


FIGURE 2.2 ● Piaget's stages of development

Source: McDevitt et al. (2013). Printed and electronically reproduced by permission of Pearson Education, Inc., Upper Saddle River, NJ.



Experience is vital for children to develop their thought patterns. See *Strategies for teaching the pre-operational student*.

Children at this stage:

- (a) classify objects based on a single characteristic
- (b) form and use symbols such as words, gestures and signs
- (c) mime or pretend actions such as combing their hair
- (d) formulate primitive concepts
- (e) are egocentric – that is, have difficulty in taking another person’s point of view
- (f) have difficulty in considering more than one aspect of a situation at a time (decentring)
- (g) have difficulty understanding conservation (that the amount or quality of matter stays the same even though its shape or position can change).



STRATEGIES

Teaching the pre-operational student

- Use concrete materials, e.g. blocks, rods
- Use visual aids, e.g. pictures, whiteboards, interactive whiteboards, tablet technology
- Keep instructions brief, using gestures to highlight intent, e.g. explain by acting out a part
- Provide hands-on practice, e.g. cut-out letters to build words
- Provide a wide range of experiences to build up concept learning, e.g. visits to gardens, theatres.

Source: Based on Woolfolk & Margetts (2013); Santrock (2010).

③ Concrete operational stage (7–11 years)

At this stage individuals can apply logical thought processes but only with concrete objects or problems. They can think through particular actions without having to go through the process of trying each one by trial and error.

Individuals operating at this stage are typically tied to personal experience. If they can complete activities with concrete objects they can produce all kinds of thinking. A major element is reversibility – the ability to reverse one’s thinking processes: to realise that a ball of clay can make a dog, but that it can be returned again to a ball of clay. See *Strategies: Teaching the concrete operational student*.

Children at this stage:

- (a) can use different classification systems. They can sequence numbers and classify objects by colour, shape or size
- (b) can recognise the stability of the physical world
- (c) can recognise that elements can be changed without losing their basic characteristics (conservation)
- (d) can rank different objects in order, for example based on size (serialising)
- (e) develop a more socio-metric and less egocentric approach when communicating with others.



STRATEGIES

Teaching the concrete operational student

- Keep using concrete materials, e.g. artefacts, objects
- Keep using visual aids, e.g. timelines, overhead transparencies, whiteboards, interactive whiteboards, tablet technology
- Use familiar examples to go from the simple to the complex, e.g. compare the local environment with far-away places
- Ensure presentations are brief and well organised, e.g. use a small number of key points
- Give practice in analysing problems and activities, e.g. use riddles and brainstorming.

Source: Based on Woolfolk & Margetts (2013); Santrock (2010).



PRACTICAL APPLICATIONS

How I use Piaget in my teaching

With my Year 7 class I find Piaget's developmental theory an important guide to how I teach Mathematics. I know that some of my students are at a concrete operational stage while others are at a formal operational stage. Therefore I have to use a range of concrete examples (coloured circles, geometric shapes, plastic cards) to give my students hands-on experiences and to encourage them to discover the rules of addition, subtraction, multiplication and division.

4 Formal operational stage (11 years and above)

Individuals can now operate at a new level – that is, at a formal level. They can use hypothetico-deductive reasoning and focus on 'what if' and 'what might be' questions. Students operating at this stage are able to consider abstract possibilities; they can hypothesise and consider a range of alternatives. However, they may not be able to describe to others the system of reasoning they are using.

Students are able to imagine ideal scenarios for themselves and others. They often become very involved in egocentric activities such as analysing their own beliefs and attitudes. See *Strategies: Teaching the formal operational student*.

Students at this stage can:

- (a) do formal thinking using abstract possibilities but may not be able to explain the thinking processes they use
- (b) imagine ideal world scenarios
- (c) become engrossed in adolescent egocentrism
- (d) reason from general principles to specific actions
- (e) systematically explore logical alternatives
- (f) isolate individual factors and possible combinations of factors that can contribute to a solution.

It is problematic that formal operations thinking is so little widespread among adolescents and adults. Woolfolk (2010) suggests that many high school students are not able to cope with formal thinking, as in subjects such as Mathematics or Science.



Pause for thought

Think back to teachers you had at school. How did those teachers facilitate formal operational learning with all students in the class?



STRATEGIES

Teaching the formal operational student

- Keep using concrete operational materials, e.g. computer-based simulations
- Provide opportunities for students to hypothesise, e.g. writing points of view on controversial topics
- Provide opportunities for students to inquire, e.g. individual and group projects
- Use broad concepts rather than facts, e.g. environment and pollution
- Use activities that are highly relevant to students' interests, e.g. use modern songs to discuss a social problem.

Source: Based on Woolfolk & Margetts (2013); Santrock (2010).

Implications of Piaget's theory for teaching

Piaget's theory has had a major impact on educators and schooling because of the following insights:

- children think differently (in qualitative terms) at various stages of their development. Their movement through these stages depends on the quality of their experiences
- learning requires the child to be actively involved, physically and mentally, in their environment for learning to occur
- children build their own cognitive structures. They do not passively receive knowledge but organise and transform it according to their cognitive structures
- children think differently to adults and their thinking levels vary at different stages.

As teachers, it is important for us to observe and listen carefully to what our students say rather than trying to analyse how they think. Some of the concepts and principles included in Piaget's theory have important implications for developing students' thinking.

Concrete materials

Especially in kindergarten and in the early primary years, students need to work with concrete objects – to manipulate, act, touch, see and feel things. As noted by Gage and Berliner (1998, p. 124) 'children who have not played with beads, rods and lumps of clay may have difficulty understanding addition, subtraction, multiplication and division'.

Open learning

Open classrooms, appropriately established, can enable students to work on various individual projects in keeping with their respective stages of development. They have opportunities to collect, structure and reorganise materials and produce various conclusions to puzzles or issues. Students can make decisions about their work and can develop responsibility for setting and meeting their educational goals based on their developmental stage.

Discovery learning

Thinking involves discovering answers to problems. Inductive approaches by children to particular problems can lead to important personal discoveries. This is very important for students in their stage of development of acquiring an understanding of more complex concepts and principles (De Vries & Zan, 1994), and social development (Becker & Varelas, 2001).

Matching strategies to abilities

Piagetian stages provide some insights to assist teachers in providing learning experiences that match the respective abilities of students. The learning activities must create sufficient puzzlement (disequilibrium) to encourage students to think about solutions.

Pace of learning

Students need opportunities to work through activities at their own pace rather than being subsumed within a total group pattern. Students will vary considerably in how successful they are with certain tasks because of their different developmental patterns. Most important of all, students need time and opportunities to sort out for themselves their construction of knowledge.

Criticisms of Piaget's theory

Piaget's theory has had a major impact on educators concerned with cognitive development. Various educational programs have been designed around this developmental orientation, especially for primary school students.

However, recent research has uncovered data that disputes a number of Piaget's principles. According to McInerney and McInerney (2005) recent research has addressed the following problems:

- Are the stages Piaget described really universal?
- Do they cut across domains of knowledge?
- Do the various cognitive abilities associated with the stages emerge at the ages Piaget predicted?
- Are the developmental stages he described invariant across individuals and cultures?

Without doubt, Piaget has had great influence in the field of developmental psychology. We owe to him the present state of the field of children's cognitive development and the current vision of children as active, constructive thinkers (Santrock, 2010, p. 57).

Bruner

Jerome Bruner (1966) also examined children's cognitive growth. Bruner's insights included the following:

- Intellectual growth is directly related to a child's ability to become independent of responses from stimuli. At first, children respond directly to stimuli, but as they develop language they learn to modify these responses.
- A child's intellectual growth depends on the development of an internal information-processing and storage system to represent the world. They need this symbol system, such as language, to predict, extrapolate and to hypothesise.
- Intellectual development involves a child's ability to be able to describe past and future actions.
- Children need systematic interactions with a tutor/adult to achieve cognitive development.
- Children need language to communicate with others, to question, to link the new with the familiar.



Pause for thought

Do you agree with Bruner that learning is an active process in which learners construct new ideas or concepts based upon their current/past knowledge? Have you observed this type of learning happening in classrooms or with children in your own family?

Bruner emphasised that children gradually organise their environment into meaningful units or 'categories' (for example, categories for food, clothing and danger). Categories are built up through a process of coding – children encode their experiences working from the specific to the general (McInerney, 2014).

Based on his studies, Bruner identified three stages of growth. Although they have developmental characteristics similar to those posited by Piaget, it should be noted that Bruner did not stress their hierarchical nature.

- 1 The *enactive* stage is the first stage commonly experienced by children and is predominantly learning by doing. Children do things with objects – such as holding, moving, rubbing, touching – and this provides them with a necessary understanding of their environment.
- 2 The *iconic* stage involves the use of imagery but not language. Children decide on actions based on sensory impressions. As noted by Barrow (1984), this stage refers to the type of learning involved in the ability to recognise instances of something without being able to give an account of the concept, or to picture things that one could not describe. Bruner (1966) identified a number of characteristics of iconic knowledge, including: it is inflexible; it focuses upon small details and it is self-centred.
- 3 The *symbolic* stage is the final stage where children obtain understanding through the use of symbol systems such as language, logic and mathematics. These systems enable children to arrange ideas and store them so that they can be retrieved when needed.

Although Bruner contended that children tend to develop through these stages, he also stressed that an individual might employ the iconic, enactive or symbolic modes of learning at any time, and possibly concomitantly. Consequently, teachers will get a better result with learners if they combine concrete, pictorial and symbolic presentations of material.

In subsequent books, Bruner outlined the importance of *discovery learning* in terms of understanding the structure of a subject being studied, the need for active learning to make personal discoveries and the value of inductive reasoning (see *Strategies: Using discovery learning*).



STRATEGIES

Using discovery learning

Students must identify key principles for themselves. Teachers present examples and students work with the examples until they discover the interrelationships and hence the subject's structure.

- Present both examples and non-examples of the concepts you are teaching.
Example: In teaching about mammals include people, kangaroos, cats and non-examples such as fish and frogs.
- Help students see connections among concepts.
Example: Get students to think about alternative names for concepts (orange, fruit).
Use diagrams to point out connections.

- **Pose questions and encourage students to find answers.**
Example: Why do some fruit have thick skins and others have thin skins?
- **Try to get students to make intuitive guesses.**
Example: Give out incomplete diagrams or sketches and ask students to complete them.

Source: Woolfolk & Margetts (2013).

Vygotsky

Lev Vygotsky lived in USSR during the first half of the 20th century. As a psychologist, he focused on social interaction as the major determinant of human development. His theory is basically a social constructivist approach (Santrock, 2010). Translations of his work in English did not appear until the 1960s and 1970s and he has had a major influence in recent decades.

Vygotsky asserted that it is people, especially adults in the child's world, who influence cognitive development. Children are in constant contact with parents, teachers, peers, friends and relatives. Parents and teachers read to them, explain points and hold conversations. Friends and peers encourage conversations and discussions. The media are relevant for the development of intellectual skills. It is interesting to note that Vygotsky, living in the early 20th century, only considered such intellectual skills as systems for counting, works of art, writing and maps. If Vygotsky had lived in the 21st century he would have no doubt included the computer as a major intellectual tool (Krause, Bochner & Duchesne, 2003).



Pause for thought

It is argued by some writers that although Vygotsky's theory applies to language learning in children it can be applied to learning in a digital era. You might like to consider how the computer can be used to develop children's intellectual skills along with those of parents and teachers.

Vygotsky (1978) focused particularly on the social world of the child and noted that one's culture tends to determine the stimuli that occur. Children internalise certain aspects and not others, in keeping with the dictates of a specific culture. It is these social processes that lead children to behave in certain ways (Roth & Lee, 2007). Vygotsky argued that children's talking/mutterings to themselves (private speech, or inner speech, see Renshaw, 1992) plays an important role in cognitive development. Children use private speech to communicate with themselves and to guide their behaviour and thinking. Private speech is typically abbreviated and fragmentary because it is an internal dialogue that only has to make sense to the individual. By contrast, outer speech has to be readily understood by others.

Vygotsky maintained that private speech has an important role in the development of thinking. He posited four stages in the development of thought:

- 1 non-verbal thought and conceptual speech
- 2 beginning of a merging between thinking and speech
- 3 egocentric speech (overt)
- 4 egocentric speech becomes covert.

At the first stage (the first two years of life) there is no relationship between thought and speech. By the second stage, at about the age of two years, children start to connect their thinking with their

speech. They label common objects by their names and start to talk to other people. At the third stage, a child's speech starts to direct thinking and behaviour. Children at this stage often announce what they are going to do before they do it – 'I am going to ride my bike'. Children at this stage often talk to each other about what they are doing. During the fourth stage, the overt egocentric speech is gradually overtaken by private speech. Children start to use covert, abbreviated speech to talk about their actions.

For Vygotsky, learning commences in the social world. Children learn language and ways of thinking from others. It is only when their speech becomes established from talking to others that they can begin to have covert speech – monologues with themselves. Children transform their knowledge of what others have said in dialogue into their own personal schemata (along the lines described by Piaget).

According to Vygotsky, if children encounter ideas that do not fit into their existing schema, then there is an imbalance and they need assistance from adults or others to return to a state of balance. He used the term *zone of proximal development* to indicate that there is a boundary area where on one side children can cope independently with particular knowledge and skills but beyond that boundary they need adult assistance.

There are important implications here for teachers. Students may be able to do tasks at higher levels if they are given assistance to get them past the zone of proximal development.

McInerney (2014) refers to this assistance by the teacher as 'scaffolded instruction'. Just as a scaffold supports a building until it is completed, scaffolded instruction provides initial support from the teacher for children's early efforts. 'As children become more adept at performing a new task, their scaffolding is gradually phased out so that they eventually accomplish it entirely on their own' (McDevitt, Ormrod, Cupit, Chandler & Aloa, 2013, p. 226).

Gradually, through this process of teacher social interaction, the student increases in cognitive development. Teachers should provide instruction at a level just above a student's independent level of functioning but not so high that it becomes frustrating for the student. That is, instruction should be at a sufficiently high level to constantly push students and to operate beyond their actual level of cognitive development. Students will need support from a teacher and able peers as they grapple with more complex ideas, but this is a vital process. The knowledge students acquire through interacting socially with the teacher and peers becomes their individual knowledge. Students should be encouraged to use language to organise their thinking and to talk about what they are doing (Chomsky, 2009).

PRACTICAL APPLICATIONS

How I use Vygotsky's theory in my teaching

Use of scaffolding

In a high school geography lesson I ask my students to take notes during my short explanation. Before I start I give them a detailed outline so they can use this to organise their notes. During the explanation I remind them about what important elements to include.

Giving young children the opportunity to play adult roles

In my primary school classroom I have a learning centre corner where I have set up a range of old equipment including a telephone set, an old typewriter, an old mantelpiece clock and an old portable radio. I encourage children to discover how things work.

Implications of Vygotsky's theory for teaching

McDevitt et al. (2013) suggest that some of the implications of Vygotsky's ideas for teachers include:

- 1 presenting challenging tasks for students within cooperative learning frameworks
- 2 helping students acquire the basic conceptual tools of various academic disciplines
- 3 scaffolding students' efforts
- 4 assessing students' abilities under a variety of work conditions
- 5 providing opportunities for students to engage in authentic activities
- 6 promoting self-regulation in students by teaching them to talk themselves through difficult situations
- 7 giving students the chance to play.

Vygotsky's theory emphasises that cognitive development is essentially a social process. This is of great importance to teachers who have to plan how to teach students from diverse social and cultural backgrounds. Students from diverse backgrounds share discussions with each other developing social norms and understanding.

A summary of Piaget's, Bruner's and Vygotsky's cognitive development theories and their application to the classroom is provided in Figure 2.3.

● THEORIES OF SOCIAL, EMOTIONAL AND MORAL DEVELOPMENT

Learning involves more than just cognitive development. Students gradually develop a sense of self and identity. They gain perspectives about personal social behaviours that often involve moral judgments. This typically occurs as a result of interactions with parents and peers.

To provide a focus for specific learning problems you may encounter with individual students in your class, consider using the following questions, based upon the three theories described.

- Piaget*
- What developmental level is the student working at?
 - Do you consider that the student has the necessary schemata to learn the task?
 - Are the material and techniques appropriate for the student's developmental level?
 - Is the student just entering a new development stage and not yet ready to perform a particular task?
 - Has the student had sufficient opportunity to explore new material, physically and cognitively?
 - Is the material too unfamiliar or irrelevant to the student's past experiences?
- Bruner*
- Has the student had sufficient opportunity to have had sensory contact with the new material?
 - Has the teacher presented examples and non-examples to the student?
 - Has the student had the opportunity to ask questions about the concept?
- Vygotsky*
- Has the level of instruction been focused within the student's zone of proximal development or has it been too low or too high?
 - Has the student's learning been too confined to individual learning?
 - Have the student's social needs been met?
 - Have forms of teaching been used which were culturally unfamiliar to the student?

FIGURE 2.3 ● Cognitive developmental theories and the classroom

Two theories have been selected for closer study as they have direct implications for learning in classrooms – Erikson’s Stages of Psychosocial Development and Kohlberg’s Stages of Moral Development.

A theory of psychosocial development – Erikson

Erik Erikson spent his childhood in Germany and in adolescence was tutored by Freud in Austria (Berger, 2000). He published important books in the 1950s and 1960s in which he established his theory about a person’s drive for identity (for example, Erikson, 1950). He argued that it is identity which is the basis for personality development and that our search for identity continues from infancy through to old age. Schools play an important role in children’s search for identity as they are social settings (Sanrock, 2010).

The eight stages in Erikson’s theory are interdependent and any solutions to developmental identity crises made earlier in life will affect later decisions. If each of the crises is solved successfully, a person’s personality becomes strong and vigorous and they are able to cope successfully with subsequent identity crises.

The alternative for some children is to resolve crises in a negative way. This can lead to difficulties and problems at later stages. Erikson saw the tension between negative and positive polarities as necessary for healthy psychosocial development (Krause, Bochner & Duchesne, 2003; Price, 2005). See also Table 2.2.

TABLE 2.2 ● Erikson's eight stages of development

Stage	Approximate age (years)	Psychosocial stage	Tasks associated with the stage
1	0–1	Trust v mistrust	Child's need for forming a trusting relationship with an adult.
2	2–3	Autonomy v shame and doubt	Children begin to do things on their own (e.g. feeding, dressing) which involves self-control (e.g. toilet training). If children don't do these things they have self-doubts and become ashamed of their inabilities.
3	4–5	Initiative v guilt	Children try out and play act many new roles. If they are disciplined for acting without thinking they can develop feelings of guilt.
4	6–12	Industry v inferiority	Children begin to master all basic cultural skills and norms, including fundamental skills of literacy and numeracy. Failure can lead to feelings of inferiority.
5	13–18	Identity v role confusion	Adolescents and young adults have to adapt to puberty change, occupational choice.
6	19–25	Intimacy v isolation	Individuals develop deep and open commitment to others or run the risk of becoming psychologically isolated.
7	26–40	Generativity v stagnation	Adults bear and rear children and are involved in training future generations, or there is a risk of stagnating.
8	40 plus	Integrity v despair	Consolidation of identity and acceptance of self, or at risk because they despair of their existence.

Childhood stages

1 *Basic trust v mistrust*

At stage 1, babies soon find out who they can depend on and who they can trust. Babies have needs for food and care and perceive the world either as a predictable, trusting place or as a chaotic place where they develop mistrust.

2 *Autonomy v shame and doubt*

At stage 2, toddlers are capable of doing much more on their own, such as feeding, dressing and walking. Becoming toilet trained is of particular importance. If young children achieve these levels of independence they have mastered this identity crisis positively. Conversely, if they do not achieve these skills, they can develop feelings of guilt and shame.

3 *Initiative v guilt*

At stage 3, children of typically 4–5 years of age like to be active and want to engage in all kinds of activities. They want to initiate various activities, but this can cause conflicts if some activities are not sanctioned by adults. Children at this stage want to explore and develop their imagination through language and through physical activities. If adults control these initiatives too rigidly, children may develop feelings of guilt.

4 *Industry v inferiority*

At stage 4, which corresponds to the years 6–12, children are faced with myriad demands, especially at school. If they are successful with academic tasks, and get on well with their peers, they are rewarded for their industry or competence. This applies especially to using basic skills such as literacy and numeracy in formal learning situations and wider social skills with their peers. Children who do not succeed feel rejected and develop feelings of inferiority.

5 *Identity v role confusion*

Stage 5 is a critical identity crisis stage for adolescents. Adolescents at this stage have to make major decisions about who they are and who they want to become. It involves establishing a variety of identities, including a clear sexual identity, an occupational identity and a family identity. According to Erikson (1950), exploration is at the heart of the adolescent transition. Identity crises may not necessarily be acute or severe but they have to be explored.

Adult stages

6 *Intimacy v isolation*

Adults have to cope with intimacy identity crisis at stage 6 whereby they are prepared to develop deep, intimate relationships with others. Those individuals who cannot cope with this level of giving and sharing will retreat into isolationism.

7 *Generativity v stagnation*

Adults have to deal with the stage 7 identity conflict of caring for and guiding the next generation. That is, it involves a commitment to bear and rear children, to be a support to their development and to others in the community. It can extend to wider concerns about a nation or about the environment. Adults who do not make these generative commitments tend to stagnate.

8 *Integrity v despair*

Stage 8 refers to persons over 40 years of age and their ability to cope with subsequent life crises. A positive response involves making decisions that are consistent with their lifestyle and which uphold their credibility with others. Alternatively, there will be some adults who are not able to cope with these crises and they submit to ever-deepening levels of despair and they fear death.

Key to Erikson's theory is the understanding that at each stage of development individuals have positive and negative experiences and the total personality at any time reflects the balance struck between them. According to McInerney and McInerney (2005, p. 419) 'if children experience basically negative or confusing experiences, they may be unable to establish a sense of self-identity.'

Critique of Erikson's theory

Because Erikson's principles and stages are general and descriptive, it is difficult to use normal scientific procedures to test them. There is little direct research evidence to support or refute the theory. However, studies have examined the quantum crisis style for adolescents (Boyes & Chandler, 1992); the effects of divorce on young children and their greater risk for depression and emotional disturbance (Doherty & Needle, 1991); and the importance of trust between toddlers and their mothers (Sroufe, 1988).

Pause for thought

Do you consider that young adults today are better able to deal with life crises than young adults who were brought up in the 1960s and 1970s? Consider in particular, levels of youth suicide and depression symptoms.

A theory of moral development – Kohlberg

Lawrence Kohlberg was a student at the University of Chicago in the 1950s. He was strongly influenced by Piaget's work, especially his theorising about the development of morality. Kohlberg also used Piaget's methodology of clinical interviews to collect his research data (McInerney & McInerney, 2005).

It could be added that Kohlberg also highlights social cognitive views through students making decisions in social settings. His theory of moral development also has elements of behavioural learning theory in that it emphasises students' types of decisions and the effect these decisions have on their behaviour (Hunnicuttt & Vollman, 2011).

Piaget proposed that all children progress through two stages of morality, a stage of 'heteronomous morality' (where children's sense of morality is based on consequences of breaking rules) and a second stage of 'autonomous morality' (where children recognise that rules are invested by others and can be changed).

Kohlberg was influenced by these two stages and the stages of cognitive development that Piaget had developed, especially sensori-motor, pre-operational and concrete operational. Piaget used a series of simple experiments to obtain details of children's thinking at different stages. Kohlberg used moral dilemmas in the form of stories and told these to children of various ages as well as to young adolescents and adults in several countries. He used the reasons the interviewees gave for their solutions to a dilemma as the basis for constructing a sequence of stages of moral reasoning.

Kohlberg (1975) theorised that there were three main levels of increasingly complex and moral reasoning and that there were two sub-stages at each level. Further, he concluded that the stages were an invariant sequence. Kindergarten, preschool and young primary school children were mainly at stages 1 and 2. Second level moral reasoning occurred mainly at adolescent levels. Third level reasoning was usually found in adults.

Children will progress through these stages as they actively react to their environment. Some will move at faster rates than others and only a very few (perhaps 20%) will ever attain the sixth level. The purported strength of this approach is its emphasis on a 'natural' sequence and therefore the role

of the teacher is simply to enhance the child's development along a path that will inexorably occur over a period of time. See Table 2.3.

Kohlberg rejected the focus on values not only because of the lack of consensus on which values should be included but also the complex nature of practising them. He argued that the alternative of focusing on stages of moral development was far better because they indicate how a person integrates their norms and values into a moral choice (Nucci, 2008)

At a *pre-conventional level*, children behave because there are consequences for certain undesirable behaviours. They do not necessarily conform because they consider it is desirable to do so.

At stage 1, children behave basically in terms of identified consequences; that is, compliance orientation. There may be consequences if they are caught doing something that is not approved of by adults. They are aware of rules and they are especially aware of the consequences if they break these rules.

At stage 2, children are concerned about their own pleasures. They are motivated by self-interest or doing exchanges with others so that both parties gain. The relationships are chiefly reciprocal (one good turn deserves one in return) and not based on justice.

At a *conventional level*, children and young adults behave because there is a desire to maintain the social order. Moral judgments are based on performing 'good' and 'bad' roles.

At stage 3, people make judgments that will earn them approval for being 'good'. They are concerned about pleasing or impressing others. They are aware that they need to consider the feelings of others.

At stage 4, people make moral judgments based on law and order. They feel that they have a duty to maintain the existing social order, even if some of these laws might disadvantage them. They must uphold the traditional values of the family, community and nation. These customs and laws are very important and absolute.

At a *post-conventional level*, which is reached by only a small proportion of individuals, the emphasis is on developing self-chosen principles and being true to them. It can involve the development of shared principles and standards that may not be in accord with traditional laws and customs.

TABLE 2.3 ● Kohlberg's stages of moral development

Level	Approximate age (years)	Stages
Pre-conventional level (focus on self-interest)	0–9	Stage 1 Avoidance of discipline and unquestioning obedience to superiors are valued.
		Stage 2 Right action consists of that which instrumentally satisfies one's own needs and occasionally the needs of others (instrumental relativist orientation).
Conventional level (focus on maintaining social order)	9–19	Stage 3 Positive behaviour is that which pleases or helps others and is approved by them (interpersonal concordance orientation).
		Stage 4 Authority, fixed rules and the maintenance of the social order are values.
Post-conventional level (focus on shared principles)	20 and over	Stage 5 Values agreed upon by the society, including individual rights, determine what is right.
		Stage 6 Right is defined by one's conscience in accordance with self-chosen ethical principles (universal ethical principle orientation).

At stage 5, individuals make judgments about right actions based on individual rights and standards. There is an emphasis on procedural rules for reaching agreement. Social contracts between individuals can be negotiated.

At stage 6, individuals focus on self-chosen ethical principles in terms of their conscience. They make a specific decision for a particular situation. Their conscience guides them as they interact with others and produce decisions that earn mutual respect.

To illustrate how individuals at different stages of moral development might react to a moral dilemma, consider the following account, which is a summary of a moral dilemma used by Kohlberg (1966, p. 64):

In a European country a woman was suffering from a special type of cancer and was near death. Her doctor thought that there was a drug, a form of radium, that might save her. The local chemist had obtained this and was charging customers \$4000 for a small dose. The husband of the sick woman went to his friends to try to borrow the \$4000 he needed but all he could collect was \$2000. He told the chemist his wife was dying and asked him to sell it cheaper or give it to him on time payment. The chemist refused to help. The husband became desperate and considered breaking into the chemist shop and stealing the radium.

Kohlberg (1966, pp. 64–5) posed a number of questions to this dilemma, which are summarised below:

- Should the husband steal the radium?
- Is it right or wrong to steal it? Why is it right or wrong?
- Does he have a duty to steal the drug? Why or why not?
- Is it important for a person to do anything to save another person's life? Why or why not?
- It is against the law to steal, but is it morally wrong in this case? Why or why not?
- What is the most responsible thing for the husband to do? Why?

Referring back to the six stages, some possible answers to the dilemma might be as follows:

- Stage 1 individuals might decide that the husband should not steal the radium from the chemist shop because the police would punish him.
- Stage 2 individuals might decide that the husband should steal the radium because he is worried about his wife and he would feel better if she recovered.
- Stage 3 individuals might decide that the husband should steal the radium because good husbands must take care of their wives and society expects this.
- Stage 4 individuals might decide that the husband should not steal the radium because stealing is against the law and laws must be obeyed.
- Stage 5 individuals might consider a range of options including stealing, encouraging and assisting the wife to commit euthanasia, stealing from others to pay for the radium.
- Stage 6 individuals might consider an even wider range of options including those listed in stage 5.

Critique of Kohlberg's theory

Although Kohlberg's stages were extensively researched to check the validity of the levels, there have been many critics. One major criticism raised is that the purported 'natural' progression that a person experiences through the six stages really only applies to the first four. Gibbs (1977, p. 44) argues that the last two stages represent ideological and cultural points of view and cannot be substantiated

as universal to all cultures. For example, Tzuriel (1992) argues that some cultures emphasise the collective good rather than individual rights. If this is the case, then Kohlberg is simply perpetuating another form of value inculcation. Peters (1976) takes up a similar point when he criticises Kohlberg for advocating that a morality based on the concept of justice is the *only* type of morality that is defensible. Peters also argues that it may not be morally better for individuals to progress to stages 5 or 6. It may in fact be more important for citizens to be well bedded down in the other four stages. He makes the point convincingly:

The policeman cannot always be present, and if I am lying in the gutter after being robbed, it is somewhat otiose to speculate at what stage the mugger is. My regret must surely be that he has not at least got a conventional morality well instilled in him. (Peters, 1976, p. 678)

Gilligan and Attanucci (1988) and Gilligan (1982) are critical of Kohlberg's theory because he only used male subjects in his research and the moral dilemmas he used were very abstract. They noted from their research that girls are more concerned with care, relationships and connections with other people than boys. As a consequence, they hypothesised that young girls are more inclined to caring and young boys are more inclined toward justice (Lefton, 2000). The effect of this is to give higher ratings to males because justice is at a higher level than caring. Yet other researchers, such as Galotti, Kozberg and Farmer (1991), provide evidence that there is little difference in the thinking of males and females about moral issues.

Others, such as Bear and Richards (1981) and McDevitt et al. (2013), criticise Kohlberg's theory because it focuses on moral thinking rather than moral behaviour. There is only a moderate correlation between the two, possibly because other non-moral factors affect how persons behave.

During the late 1990s and early 2000s a number of theorists developed from Kohlberg's theory a new approach, which has been termed *neo-Kohlbergian*. This approach uses moral schemata as more concrete conceptions of the stages of moral development.

Numerous classroom applications have been developed using moral dilemmas and defining issues. For example, Rest, Narvaez, Bebeau and Thomas (1999), who are considered to be neo-Kohlbergians, propose a four component framework, namely:

- 1 Moral sensitivity – students are given situations to assess and to judge whether it is a moral problem or not.
- 2 Moral judgment – students are encouraged to examine a number of possible responses to a problem and to decide which is the most moral solution.
- 3 Moral motivation – students consider all the concerns and decide whether a moral action can be justified over other personal solutions.
- 4 Moral character – students construct and implement actions and have the courage to continue a course of action.

Pause for thought

The Science Teachers Association of Western Australia (STAWA) produces a 'Socially Responsible Science' website <www.dilemmas.net.au>, which includes dilemmas about wetlands, whale rescue, climate change and transplant of human organs.

Go to the website. Select one of the dilemmas and reflect upon how useful it might be in a class. How useful are the teaching resources provided with each dilemma?





PRACTICAL APPLICATIONS

How I use Kohlberg's theory in my teaching

In studying bioethics in Science, I often use role-plays to examine moral issues. In this series of lessons with a Year 10 class, I established a hospital ethics committee whose job was to select four patients who would receive a heart transplant. Students are given a list of 20 potential patients and the committee has to debate which four will get the life-saving heart transplant. Potential patients include those from minority groups, recent immigrants from overseas and physically disabled persons. Some of the reasons students give for selecting/rejecting particular applicants raise important moral issues that provide fruitful class discussions.

● CONCLUDING COMMENTS

As noted at the beginning of this chapter, developmental theories can provide some reasonable principles that can guide our teaching. However, no single theory can provide all the answers and we should be mindful of enthusiastic scholars who distort a theory and ascribe positions to it which were never intended by the author (Gredler, 2007).

Developmental theories emphasise how children think compared with how adults think. We need to be reminded of these differences and to appreciate how children react to problems and learn by working with concrete objects, materials and phenomena.

Children can develop at very different paces and levels. They need new experiences to stimulate, enhance and reinforce their development. To a certain extent they need opportunities to do their own learning, but the social side of learning is also very important. As noted earlier in the chapter, Western developmental theories applied to Aboriginal children have less relevance because of other pressing problems.

● KEY ISSUES RAISED IN THIS CHAPTER

- 1 Some major developmental theories are analysed in this chapter based on their applicability to classroom practice. It is important to remember that each theory is a set of reasonable but tentative suggestions.
- 2 Piaget's theory has had a major impact on educators and schooling because of his stage theory of cognitive development.
- 3 Bruner's theory highlights three stages of growth, namely enactive, iconic and symbolic.
- 4 Vygotsky's theory has had a major impact on educators and schooling. He emphasised that cognitive development is essentially a social process.
- 5 Erikson argues that it is identity which is the basis for personality development and that this occurs over eight stages.
- 6 Kohlberg theorised about the development of morality. He developed stages of moral reasoning and he argued that this was a natural sequence for all children and adults.



Reflecting and exploring

- 1 Reflect on your childhood and adolescent years. What were key events that happened to you that you can recall? Are you able to link them to any of the theories described in this chapter?
- 2 Crain (2005, p. 146) asserts that 'Piaget portrayed pre-operational children too negatively, focusing on their logical deficiencies. We need to consider the possibility that young children's thinking has its own qualities and distinctive virtues.' Discuss.
- 3 According to McDevitt et al. (2013, p. 232), 'If we look beyond the very different vocabulary Piaget and Vygotsky often used to describe the phenomena they observed, we notice four themes that their theories share: constructive processes, readiness, challenge, and the importance of social interaction'. What are the differences of the two theories?
- 4 Bruner contends that teachers should encourage 'discovery' and provide inductive learning opportunities. For a particular grade/year level, describe some resources or learning opportunities that you would provide to encourage children's personal discovery.
- 5 Do you agree with Crain (2005, p. 169) that 'Kohlberg's stages provide us with an inspiring vision of where moral development might lead'? Provide a critique of Kohlberg's theory.
- 6 How might cooperative learning situations provide good opportunities for peer interaction that could lead to moral growth?
- 7 How useful is it to use real moral dilemma problems to teach moral values to students?

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