CHAPTER 1

UNDERSTANDING LEARNING: THEORIES AND CRITIQUE

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Theories of learning arise from multiple disciplines: philosophy of education, psychology, pedagogic studies, sociology and, more recently, neuroscience. This variety of feeder disciplines provides a rich understanding of learning. It also presents us with a complex evidence base and mix of interpretations with contrasting vocabularies and epistemologies that lead to debate and controversy. This chapter introduces the main groups of learning theories and key debates. It introduces terms such as 'constructivism' and 'behaviourism' that you may encounter in teaching and learning literature and it explores practical applications arising from the theories. The purpose of the chapter is to empower you to participate in conversations about pedagogy and to analyse the implications of learning theories for your discipline, your teaching and your students. An understanding of learning theories, their applications, limitations and their continuing refinement provides you with a powerful vocabulary and framework for organising thinking and making sense of the challenging demands of university teaching.

Towards contemporary theories of learning

Prior to the early 20th century, most educational thinking focused on philosophical debates about the nature of learning (see Palmer 2001). A key thinker was the progressive educationalist John Dewey, who railed against the authoritarian, rote learning, drilling approach that characterised teaching of the age that prioritised facts over understanding. He argued that this model did nothing for children's sense of exploration or growth. Students should be active in the learning process, and education should engage and enlarge experience. He made an incalculable impact on education systems, and his ideas reverberate in our current understanding about how students of all ages learn.

Learning by association: behaviourist perspectives

From the early 20th century the advancement of science brought a new empirical approach to the study of learning. Characterised by experimentation, much involved the investigation of animal learning behaviour: you will probably be familiar with Pavlov's famous 1903 experiments with dogs and bells (Pavlov 1927). Initially studying digestion, he observed that the dogs were changing behaviour over time, learning to anticipate the arrival of food on sight of an associated stimulus, such as a bowl. Further experiments paired unrelated stimuli, such as sounds, with the food, and the dogs quickly learnt this association too. Pavlov referred to this process of changing behaviour by repeatedly pairing stimuli as conditioning, and so began a huge step forward in our understanding of learning by association.

Pavlovian conditioning, also known as classical conditioning, forms part of everyday learning and the shaping of perceptions. Students are not born, for example, with a fear of exams, but test anxiety can develop from association with previous negative experiences. Similar experimental work blossomed in the United States, deepening our understanding of learning through association, reinforcement and incremental growth (Thorndike 1898). Where Pavlov demonstrated how learning occurred through the simple pairing of stimuli, Skinner (1938) developed experiments that required pigeons and rats to perform tasks that would then be rewarded. By modifying tasks and using series of positive rewards and negative reinforcers he demonstrated how behaviours could be *shaped* and *reinforced* towards target outcomes. These experiments established another major principle of learning referred to as instrumental or operant conditioning.

The influence of behaviourist theory

These studies influenced a school of research known as 'behaviourist' because of its focus on learning as observable changes in behaviour. Results demonstrated how learning occurs by environmental conditioning, connecting actions with outcomes, reacting to feedback and strengthening through repeated action. They also demonstrated the importance of specifying clear learning targets and structuring learning tasks to achieve these. The recognition that behaviour could be shaped and directed through a teacher's intervention left a great legacy: Power to the teacher!

Associative learning represents a core learning process and task design principles are applied particularly in relation to the attainment of competencies, developing skills and to design of staged online learning units. The language arising out of behaviourist principles – learning outcomes, specifications, levels, standards, targets, competencies – is found throughout the literature and policies governing course design.

Practical applications: behaviourist perspectives

Principles and associated pedagogies arising from behaviourist research highlight the role of the teacher in designing and controlling the learning environment. These principles and pedagogies include:

- the use of practice and repetition to reinforce skills and memory associations
- an emphasis on systematic routine and organised activities
- an emphasis on the teacher specifying the structure, content and delivery of learning activities
- a focus on clear and assessable learning objectives and target outcomes
- the use of instructional designs that facilitate step-by-step attainment of increasingly complex competencies and skills
- an emphasis on feedback to direct learners' behaviour towards target outcomes
- use of incentives, rewards, penalties and disciplining strategies
- individualised programs that allow students to work at their own pace.

Criticisms of teaching based on early behaviourist principles

While leading to enormous leaps forward in our understanding of learning as a process, the rigidity of the empirical methodologies proved a limitation. The researcher, as a distant observer of behavioural change, was encouraged to view the mind as a blank canvas.

Behaviourist research was often over-interpreted, giving rise to an authoritarian, teacher-centred and outcome-based view of learning (Figure 1.1). The teacher came to be seen as the owner of knowledge, controller of the learning environment, with students as passive recipients; empty vessels to be filled with knowledge. Free will was considered an illusion. Emphasis on the short-term attainment of learning outcomes led to an assumption that the education program had been a success once targets had been met, irrespective of the teaching method. Rote learning is certainly effective at achieving results in the short term, but its long-term effectiveness remains questionable.

FIGURE 1.1 Behaviourist teaching methods could be authoritarian, transmissive and downplay the role of the learner. Cartoon © Claudio Furnier, used under licence from www.CartoonStock.com

Some saw the methods of these studies, their 'input–output' analyses, and the generalisation of findings from animal experiments to an understanding of human learning as limited and naïve (Chomsky 1959; Piaget 1952; Vygotsky 1978). Dealing only with observable sense data meant that internal mental processing and more fuzzy concepts like 'thinking' were not considered since they could not be measured objectively. Only the external, behavioural manifestation of thinking could accurately be measured. How could we study learning without reference to thinking? Surely we are more than the sum of our behaviours?

Thinking and understanding: cognitivist and constructivist perspectives

In reaction to behaviourism, Gestalt psychologists such as Köhler (1925) and Wertheimer (1959) took a more holistic view of behaviour and the mind. We don't simply learn what is in front of us, they argued; rather, the mind seeks patterns and relationships and elaborates to interpret the information as a whole. They suggested that the mind's sophistication in pattern-seeking and cognitive restructuring ultimately can lead to the formation of insight.

Cognitive constructivism

Cognitivist researchers explored how we come to store, retrieve and process information, how our thinking strategies develop and how we assimilate new experiences to make sense of the world. They argued for more emphasis on key questions not answered through behavioural experiments. Why does a five-year-old think differently from a fifty-five-year-old? What of higher-order thinking, such as moral and ethical reasoning? What about the different strategies that individuals adopt to solve problems? How do we go from memorising or associating facts to the generation of new ideas?

At the forefront of early cognitivist thinking in the 1920s and 1930s, Piaget noted that children's thinking appeared illogical to adults, so he studied how thinking patterns matured. Piaget (1952) proposed that children developed different ways of perceiving, interpreting and gaining meaning at different stages of growth. Through observations, analysis of dialogue and simple perception and memory tests, he identified a sequence of cognitive levels through which children progressed. The implication of this for teaching in schools was profound because there was little point in teaching certain levels of complexity, reasoning or abstraction until children's minds had developed an appropriate level of sophistication. These ideas led Einstein to comment that Piaget's discovery 'was so simple, only a genius could have thought of it' (cited in Papert 1999). Piaget's work was rediscovered by educationalists in the 1960s (Duckworth 1964) and school teaching responded accordingly.

Of wider significance was Piaget's notion that the maturing brain develops concepts: flexible frameworks into which we assimilate knowledge and experience. Piaget referred to these conceptual networks as 'schemas'. Understanding becomes increasingly sophisticated as schemata grow and restructure during the process of assimilating new information. By adulthood, a person has developed countless schemata for everything from peeling an orange to sophisticated concepts like love and anger.

Piaget's criticism of behaviourist research was that we can only understand how to improve education once we understand how we deal with information mentally: 'To present an adequate notion of learning one must first explain how the individual manages to construct and invent, not merely how he repeats and copies' (Piaget 1970). When we do so, we realise that the process of learning involves active construction and, accordingly, learning should itself be active: 'Children have real understanding only of that which they invent themselves, and each time that we try to teach them something too quickly, we keep them from reinventing it themselves' (Piaget, quoted in Papert 1999, p. 105).

This thinking reinvigorated a philosophy of learning known as 'constructivism', essentially a theory that knowledge can be constructed only in the mind of the learner. This reflected much of Dewey's thinking and was now given a stronger foundation through Piaget's work. The onus was clearly shifting to the learner as the creator of understanding.

Since the 1960s research has mushroomed to provide insight into thinking development. Bloom and Krathwohl (1956) developed a taxonomy of educational objectives of great practical value to teachers in understanding the structure of cognitive skill development and in formulating learning objectives in course design. Within their classification, cognitive skills are arranged in a hierarchy of increasing demand, from recall and manipulation to synthesis and evaluation.

Cognitive preferences

Research has also focused on individual differences in cognition. For example, Gardner (1983) argued that there are multiple intelligences which individuals possess to varying degrees. These include linguistic, musical, logical–mathematical, spatial and interpersonal intelligences. In contrast, Sternberg (1996) conceived intelligence as the success with which an individual selects, adapts to and shapes the real-world environment by integrating various practical, analytical and creative skills.

Individuals process information differently. Riding and Cheema (1991) reviewed studies into cognitive style and learning preference, concluding that findings could be grouped into two dimensions. An analyst–holist continuum describes ways in which a person may deal with information. An 'analyst' would break information into constituent parts, dealing with these separately while a 'holist' deals with a concept as a complete entity. A visualist–verbaliser continuum describes how a person thinks through either processing images or through text and language. Most learners will be multi-modal rather than fall into the extreme ends of these categories. This research is valuable in that it informs teachers about the nature of differences and encourages reflection about teaching.

Information processing and memory

Understanding how the brain encodes information and transfers this to and from memory has significance for teaching. Learning and retrieval is made easier if existing schemata are activated prior to presenting new information through, say, reminders, revision or reading (Jensen 1998). Externalising memory, for example using concept maps, representations or lists, can help with 'computational offloading', freeing the brain from recalling the information to examine its content and relationships (Zhang & Norman 1994).

We have also learnt from studies of working memory and cognition that the order in which information is encoded is significant, as is the method. Where information is learnt and retrieved using a variety of methods it is more likely to be recalled (Baddeley 2000; Baddeley & Hitch 1974; Healy et al. 2000). Retrieval is also stronger when information is associated with meaning. Inspiring teachers are memorable because they use surprise, novelty, emotion or attach relevance and meaning to the information (Jensen 1998). Analogies, storytelling and metaphors are useful strategies to attach meaning to new learning.

Studies into cognitive loading highlight the limitations of working memory which, at any one time, is thought to hold only a small number (seven chunks) of information during processing. Awareness of this for teachers is important as there are real limits to what the brain can absorb while simultaneously processing information (Sweller 1988). This explains why students look drained as you approach slide 50 in your one-hour lecture. This has practical implications for how learning episodes are sequenced, showing a need for chunking of information and provision of space to limit overload and to allow information to be worked. Dempster (1988) highlighted the importance of spacing effects, and revealed how material distributed across several sessions is better remembered than when concentrated within a single session.

Neuroscience

Neuroscientists provide a direct look at the brain's functioning through imaging. This field is exploding some influential ideas and 'edumyths' about how people learn. For instance, the brain's hemispheres are known to specialise but there is no evidence to support the popular idea of the intuitive 'right brain' or rational 'left brain' (OECD 2007). Similarly discredited is the idea that the brain's structure is defined by infancy or by adolescence. While there are sensitive periods for limited aspects of language development in infants, evidence suggests that the brain retains plasticity over its lifetime (Koizumi 2004; OECD 2007).

Neuroeducational research offers fresh insight into motivation through examination of the brain's reward system. Howard-Jones (2010), for example, questions why some students drift off in a well-planned lesson, then go home and get captivated for hours in computer games. Experimental studies showed that release of dopamine, a reward chemical, is triggered when there is greater unpredictability and uncertainty associated with learning, which has implications for the design of learning activities and games (Howard-Jones & Demetriou 2009). This effect was shown to be more significant for male students.

Advances in neuroscience support cognitive studies into working memory and its influence on attention (Fukuda & Vogel 2009) and highlight the importance of learning space in instructional design. Taylor et al. (2007), for example, describe how the brain has the neural machinery to learn from errors, which has implications for how university teachers create an environment for learning, implying a need for practice space to ensure error-making, a natural part of the learning process. Finally, neuroscience illuminates the fundamental role of emotion in learning, with Immordiano-Yang and Damasio (2007) suggesting that emotional processes are particularly important in transferring learning to the outside world (Howard-Jones 2010).

The influence of cognitive and constructivist theory

A major contribution of these theories is the view that learners are not passive, uniform, empty vessels into which we can pour second-hand knowledge. Effective learning occurs when the learner is actively involved in the primary construction of knowledge. Constructivists don't reject behaviourist theories but argue that association is only an isolated part of a more general process of learning. Piaget (1970) argued that the simple conditioned association between bell and food for Pavlov's drooling dogs would quickly fade when the ring of the bell failed to be rewarded; it is a temporary link. For the association to *persist* it must be assimilated with other concepts as part of an active process of schemata building and modification.

Evidence is growing that learning has more durable retention when taught using active, constructivist methods. Dochy et al. (2003) conducted a meta-analysis of more than 40 empirical studies on the effects of problem-based learning. They found that the method had a positive effect on development of skills, and that while students gained slightly less knowledge compared to conventional teaching, they remembered more of it. This was reinforced by Doğru and Kalander (2007) in a comparative study of teacher- and student-centred methods in science classes. After teaching, immediate tests revealed no significant difference between the methods. However, students taught by constructivist methods demonstrated better retention of knowledge in a follow-up assessment 15 days later.

For more didactic teaching and lecturing formats, cognitive research signals the importance of not overloading students' brains.

Practical applications: cognitivist and constructivist perspectives

Pedagogies arising from cognitivist research focus on schemata development, catering for individual differences in cognitive style and teaching that supports how the brain processes information. They include:

- emphasising not just new knowledge but assimilation with prior understanding, building on previous learning and exploring relationships
- activities that prevent cognitive loading by creating space for note-taking or discussion and by breaking teaching sessions into manageable chunks
- activating prior learning through use of summaries, reading prompts or questioning
- strategies such as discussion, note-building and questioning, which relate new information to existing information to aid assimilation, encoding and memorisation
- using variety and mixed media in teaching to accommodate sensory preferences
- presenting concepts in varied ways, for example in constituent parts and holistically, to cater for different cognitive styles

- 'externalising' thinking, for example through the use of lists, concept maps or flow diagrams to explore relationships between concepts
- using analogies or metaphors to help attach meaning and assimilate new learning
- using novelty, surprise and emotional engagement to capture the mind's attention and help memorisation.

Pedagogies arising from constructivist studies emphasise student-centred, active learning and the role of the teacher as facilitator. They include:

- an emphasis on students being active in constructing their understanding of knowledge
- a focus on discovery, exploration, experimentation and developing and testing hypotheses
- project work, research-based learning, problem- and enquiry-based learning methods (see Brodie 2012; Jenkins & Healey 2012)
- awareness of the learning process through use of reflective learning activities, self assessment and evaluation
- the role of the teacher as a guide, providing 'scaffolding' to learning – that is, to ensure the student has the requisite knowledge, skills and support to negotiate a new piece of learning – and prompting the student through questioning or modelling.

Criticisms of teaching based on cognitivist and constructivist principles

Kirschner et al. (2006) describe student-centred constructivist teaching as 'unguided methods of instruction' and argue the need for greater structure to learning activities, particularly for those students with limited prior knowledge. Noting that strategies like problem-based learning are intended to simulate professional scenarios, they argue that a distinction needs to be made between how an expert operates in their profession and how students learn that profession. The systematic nature of scientific enquiry, they say, does not lend itself well to the self-instructional techniques required of, say, problem-based learning. They argue that activities involving free exploration of a complex environment can be cognitively detrimental to learning. In response, Schmidt et al. (2007) argue that the underlying principles of problem-based learning are entirely compatible with our cognitive structures and point to the flexibility in guidance within these teaching methods.

Behaviourist and much cognitivist research have also received criticism from social psychologists and sociologists for their emphasis on how individuals learn, as if this occurs in isolation. This is almost never the case, they argue, and we must therefore focus on the effects and influences of social and cultural interaction.

Learning from others: social and situated learning perspectives

Since the 1950s, research has demonstrated the power of social influence on people's attitudes and behaviours. Conformity and obedience appear to be strongly influenced by our confidence in our own judgements. We appear more likely to conform to a group norm when we are unsure, or to bow to peer pressure to gain social approval (Asch 1955; Milgram 1963). Further, we can mimic others unconsciously. Termed the 'chameleon effect' by Chartrand and Bargh (1999), this is thought to be linked to empathy since the most empathetic people appear to mimic most.

A phenomenon that you will encounter with group learning is that of social loafing – the reduced effort that individuals make, often unintentionally, when working in a team (Latané 1981). Relevant also to the classroom is an effect termed social facilitation, whereby an individual's performance is strengthened or inhibited by the pressure of performing before an audience. The positive or negative direction relates to how easy or difficult the task is perceived to be (Guerin 1986; Towler 1986).

In classroom debate or online communities, it is possible that the strength of students' viewpoints can be amplified as a result of siding with others of similar opinion, an effect called group polarisation (Wilson et al. 1975). Another powerful effect, 'group-think', describes poor decision-making arising from a desire to maintain harmony within the group (Janis 1972).

Social constructivism

Vygotsky was an originator of social constructivism. He highlighted the social origins of thinking, through the influence of language, culture and the interventions of others as we construct understanding (Vygotsky 1978). In particular, he emphasised the critical role of teachers in extending the potential of individual learning. He demonstrated that left to his or her own devices, a child could get so far with problem-solving, but with 'scaffolding' support from a teacher could achieve far more. This extended zone of potential he termed the 'zone of proximal development' (ZPD, Figure 1.2) and argued that it was toward the top of this zone that a teacher needed to target activities and support strategies such as modelling (demonstrating examples) and bridging (helping make connections). Scaffolding activities could include the use of step-by-step instructions, question prompting, demonstrations, peer collaboration, cues to students, analogies, directed study and graphic organisers. Teachers can break down tasks for students and make explicit the purpose and context of tasks.

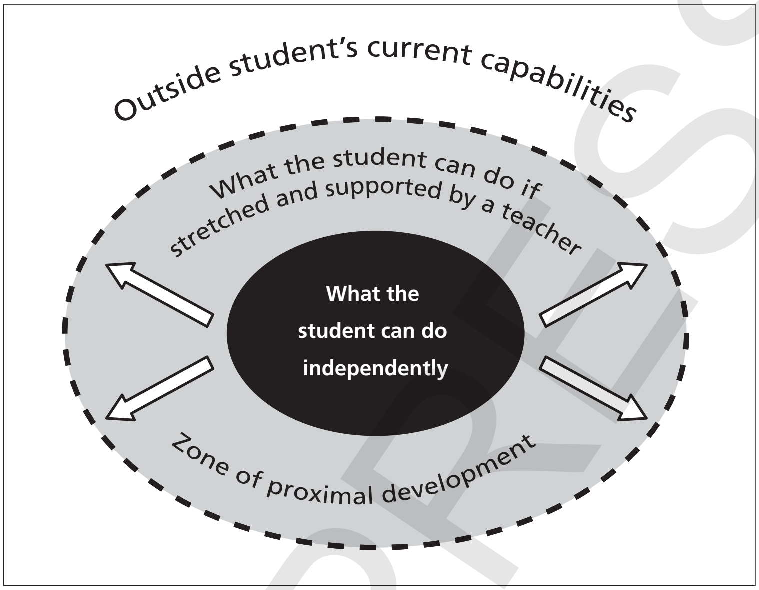

FIGURE 1.2 Vygotsky's zone of proximal development

Social learning theory

Bandura drew attention to the influence of observing people around us. His social learning theory notes that 'Learning would be exceedingly laborious, not to mention hazardous, if people had to rely solely on the effects of their own actions to inform them what they do' (Bandura 1977a). He demonstrated that much learning occurs by observing and imitating the behaviours of people around us, and assimilating their experiences into our own developing understandings. Termed vicarious or observational learning, modelling is central to this process. It is particularly influential in the formation of expectations, in the adoption of new behaviours ('watch and learn') and for developing students' self-efficacy.

Situated learning

Lave and Wenger (1991) argued that learning should be regarded not so much in terms of being educated as part of a formal program, but as a social act that occurs in everyday life. They suggest it involves the process of engaging with 'communities of practice', which refers to differing situated contexts in which individuals experience learning. For example, a student will likely be a member of multiple communities: a project group within a course unit, the wider course cohort, a student residence community, a sports club and perhaps an employee in a part-time job. Lave and Wenger suggest that learning is situated in distinct contexts and that success in any one is a function of how well individuals fit in and learn to become competent in that setting. Characteristic features of communities of practice include:

- shared interest, passion and commitment
- an identity defined by this common interest
- active engagement and interaction between members
- a structure through which advancement is possible
- use of technical language
- shared competence that distinguishes members from others.

Lave and Wenger explain how individuals enter communities at the periphery, initially involved in activities that are less important, then gradually move towards the centre becoming established members as competency, identity and involvement in key community processes develops.

Their key point is that, rather than acquiring structures or constructing models to understand the world, we participate within and adapt to frameworks that already possess structure. The implication is that we should refocus emphasis on social engagements to consider how learners become active participants in these communities, how barriers to entry are overcome and how identities develop within these social groups: 'the purpose is not to learn *from* talk but to learn *to* talk to legitimise one's position in a community' (Lave & Wenger 1991).

Social and situated learning theories have particular significance to tertiary teaching because they broaden appreciation of the complex contexts in which learning takes place.

Practical applications: social and situated learning

Pedagogies arising from social and situated learning emphasise the value of social interaction in expanding understandings and transferring learning across contexts. They include:

- identifying what students can already do and supporting learning in the 'zone of proximal development'
- an emphasis on community formation and collaborative learning, actively constructing shared understandings
- classroom debate to explore and value alternative viewpoints
- developing awareness of social learning processes
- providing opportunity to apply learning from the closed world of the campus to the real world
- developing organisational awareness by providing opportunities for peripheral forms of engagement in professional communities
- use of collaborative knowledge building tools such as wikis and online discussion boards
- an emphasis on role models.

Criticisms of social and situated learning

The main criticisms of social learning theories concern the extent to which social interactions influence behaviour. Critics argue that these theories tend to reject genetic factors as significant determinants of behaviour: the classic nature versus nurture debate (Bouchard et al. 1990).

The principles of situated learning theory are often applied to the workplace as a learning environment. Hughes et al. (2007) argue that the original empirical work was carried out in atypical communities not easily equated to modern professional workplaces. Another criticism is that the theory presumes that communities of practice are reasonably stable and that the learner adapts to a structured, self-contained environment. Instead, we live in a world of change where such communities are unstable, evolve rapidly, and within which membership is highly mobile. The process of crossing boundaries between these situated communities in itself provides a stimulus for learning (Engestrom et al. 1995).

Being human: self-theories and humanistic perspectives

The final group of theories discussed in this chapter considers the role of experiential learning and personal growth. Proponents of these theories reject the notion that humans are simply biological objects about whom everything can be explained by networks of causes. They ask: what about being human and phenomena such as choice and free will? What motivates a person to succeed? How do our self-perceptions determine how we learn?

Maslow (1970) was at the forefront in directing attention to the growth potential of people. His theory stated that humans are motivated towards self-actualisation – realising their potential – but that a hierarchy of lower-order needs require satisfaction before the learner can reach this level. These start with survival and belonging needs and progress towards higher-order needs of esteem, desire to learn and, ultimately, fulfilling potential. The implication of this theory is that students need a supportive context in which to learn: if students feel that they belong, they will be motivated to fulfil their potential and learn for learning's sake.

Rogers (1983) also believed in this natural propensity to learn. He stressed the primary role of the teacher as creating the environment, climate and conditions for this development to occur.

Reflection and transformative learning

The transformative learning theory developed by Mezirow (1991) centres on the thinking processes that occur when a person examines existing understandings and a change in perspective results. Mezirow emphasised the central role of critical reflection in working through existing beliefs, assumptions and attitudes, and stressed the role of the teacher in creating a 'safe' learning environment to nurture reflective expression.

Reflective learning was developed further by Schön (1983). He argued that contemporary methods of teaching in professional courses were inappropriate for dealing with real-world problems that are 'messy', often unique, multifaceted and shaped by factors that are highly situational. The professional may often be required to make difficult judgements in the face of ethical, political, economic or moral concerns. Schön argued for a step beyond simply matching classroom problems to textbook theories; the practitioner is required to call heavily on professional experience to construct solutions on-demand to unique situations. He developed the notion of the professional as a 'reflective practitioner', placing great value on reflective analysis of experience and on highly developed and sophisticated expert or 'tacit' knowledge.

Experiential learning theories that examine how experience fits into a cycle of learning are popular in teacher and management education. The most famous, that of Kolb (1984), involves a four stage cycle of 'experience–reflection–conceptualisation–experimentation'. These theories are valuable in guiding the sequencing of learning activities.

Self-theories

Rotter (1966) developed a scale to assess a person's 'locus of control'. This related to a person's belief about their ability to control events. To illustrate, a student with a high *internal* locus of control would believe that achievement of a task is dependent on their own behaviours and actions: 'I know if I put the work in I'll be able to conquer algebra.' In contrast, a student with an *external* locus of control might believe that success or failure is beyond their control and the responsibility of others: 'I was never taught to do algebra properly.' Recent evidence suggests locus of control may be a function of stages in the life-span, with an increase towards a more internal locus developing up until middle age (Heckhausan & Schulz 1995).

Attribution theory (Weiner 1974) extends the notion of control further by examining explanations that people use to justify successes and failures. In addition to the internal or external dimension, this considers whether causes of success or failure are stable and controllable. For example, the difficulty of a task is stable and remains outside of a learner's control. In contrast, effort is not stable: a student has a great deal of control. Students who believe success is attributable to effort will be more likely to work harder.

Self-theories feed into the concept of self-efficacy, which is seen increasingly as central to student success. Self-efficacy refers to a person's belief in their capabilities to make a difference and succeed (Bandura 1977b, 1995). This belief has an influence on how goals are defined and how tasks are approached. Students with low self-efficacy are likely to believe that certain tasks are outside their capability and will tend to avoid such challenges. Bandura explained how self-efficacy could be developed through positive experiences where tasks are mastered and through witnessing others successfully meet challenges. Positive feedback, persuasion and encouragement play a central role. There is strong empirical evidence for the positive link between self-efficacy, academic achievement and other mediating effects, such as motivation and self-regulation (Pajares 1996).

Dweck (1999) examined belief systems surrounding implicit theories of intelligence. She proposed that students sit somewhere along a continuum of mindset between a fixed view of intelligence, where success is believed to be a function of innate ability, and a malleable, incremental view of intelligence, where success is believed to be a function of hard work and study. Knight and Yorke (2004) considered the implications of this for developing students' self-efficacy in university teaching by exploring the belief systems of both students and academic staff and the dynamics of their interaction. They concluded that the ideal scenario is when both teacher and student hold malleable views of intelligence with the teacher providing supportive developmental feedback on which students can act to improve. The worst scenario is when both teacher and student hold fixed views of intelligence leading to a shared belief that 'not a lot can be done'.

Conceptions of learning and discipline understandings

Swedish educationalists Marton and Säljö (1976) developed a qualitative research methodology, called phenomenography, which explored the subjectively different ways that people experience the same phenomenon. They applied this study to the ways that students read books, and distinguished between 'surface' approaches where students read simply to memorise facts to gain sufficient knowledge to pass a test, and 'deep' approaches, where the reader is concerned with understanding the meanings of texts. This approach has been applied in higher education to understand and compare variations in students' and teachers' conceptions of learning. For example, Prosser, Trigwell and Taylor (1994) identified different ways that academics' understand and experience science teaching, ranging from simple conceptions of transmitting information to more sophisticated intentions to facilitate conceptual change in learning. This phenomenographic approach has also been applied across academic disciplines to understand variation in students' understanding of subject learning, for example in music learning (Reid 2001) and of fieldwork in geography (Stokes et al. 2011).

Also related to subject learning and discipline understandings is the theory of threshold concepts (Chapter 3, Land 2012; Meyer & Land 2006a). This describes powerful but troublesome concepts within disciplines that students need to cross in order to progress in their understanding of that subject. Crossing these thresholds leads to transformed ways of thinking about the subject.

Influences of humanistic and self-theories

One of the curiosities in university teaching is the professed abhorrence of spoon-feeding students by many academics, who then choose to teach in largely didactic ways. Humanistic and self-theories have demonstrated that if we wish to encourage self-directed learning we should create the supportive climate. This requires the teacher to step back and focus on students' personal growth.

The phenomenographic studies have contributed to our understanding of the ways teachers and students conceptualise learning, or concepts within their discipline. This arms the teacher with a crucial insight of the differing ways that students understand subject concepts which can inform approaches to teaching.

Practical applications: Humanistic and self-theories and other studies of student learning

Pedagogies arising out of humanistic philosophy, self-theories and variation in understanding highlight the role of personal growth and transforming mindsets. Teaching may be characterised by:

- an emphasis on attitudes over techniques
- identifying individual learning goals and effective learning strategies
- letting go and passing responsibility and choice for learning to the student, for example using negotiated learning contracts
- an emphasis on student support and integrated personal development planning in the curriculum
- a focus on developing skills in meta-cognition, reflection on belief systems, self-awareness of study approaches
- breaking down fixed and negative belief systems
- creating a positive environment conducive to self-directed learning
- positive role models
- an awareness of the multiple ways learners experience course concepts.

Criticisms of teaching arising out of principles of humanistic and self-theory research

Humanistic psychology as advocated by Maslow and Rogers has been criticised for lacking a cumulative empirical base, for encouraging self-centredness (Seligman & Csikszentmihalyi 2000), and for an over-optimistic view, assuming that all students are capable of self-actualisation. Critics argue that individuals often choose to ignore the positive choices in front of them and follow a negative path. Taken to its extreme, a humanistic education would be more like an open, educational retreat rather than the form of education with which we are familiar. While of great influence in personal development models, the movement has never fully materialised across formal education.

Experiential learning cycles like that of Kolb (1984) are also dogged by criticism that they are underdeveloped and lack scientific validity. Seaman (2008) suggests such models are best thought of as ideologies rather than theories with scientific foundation.

The assumption that self-theories are universal, while based on western studies, has been questioned. Gould (1999) suggests Heckhausen and Schulz's (1995) life-span theory of locus of control breaks down when seen from diverse cultural contexts. Others suggest different factors that may be more significant to student success than self-theories, for example the importance of intrinsic interest in the subject, and career orientation (Kember et al. 2010; Schiefele & Winteler 1992).

Making sense of theory in practice

So, is it necessary to understand learning theory to teach in universities? Think about your own subject: why is theory necessary to any practice or profession? It helps to provide a framework and structure to organise thinking. It suggests other ways of seeing the world and assists in locating problems and identifying solutions.

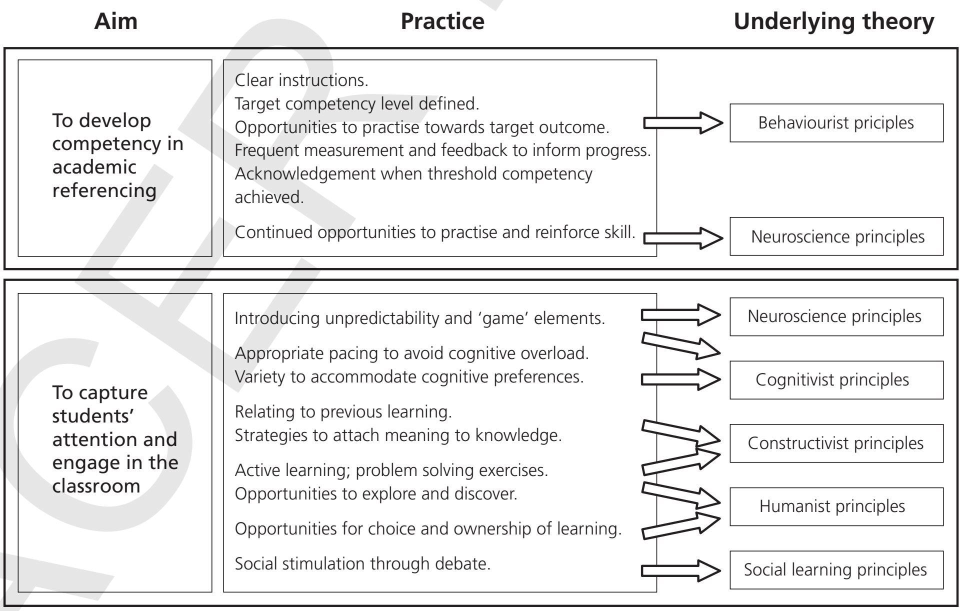

FIGURE 1.3 Examples of how a specific learning outcome or more general teaching and learning aims can draw from theoretical principles to inform teaching designs.

Figure 1.3 illustrates how a teacher might draw on theoretical principles to strengthen the design of teaching activities. A useful exercise for the reader would be to reflect on your own teaching aims – as either specified intended learning outcomes or more general aims – and to relate these to the different theories outlined in this chapter. For more detailed reviews of learning theories, their evolution and applications see Jarvis et al. (2003), Brown (2004) and Haggis (2009).

A good teacher will make an impact. Teaching and curriculum design that is informed by an understanding of how students learn optimises effective learning. Awareness of different learning processes allows teachers to make sense of the spectrum of teaching methods available and guide selection of the most appropriate tools to secure learning outcomes.