

# Appendix I: Learning Theories

## Tāpiritanga I: Ngā Ariā Ako

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Before reading this appendix, you may like to take a moment to note down the established learning theories that inform your own learning and the ways in which you try to support others to learn. How do these theories influence what you do? Why have you selected one theory and not another? How are different learning theories integrated in your schema? If you are reading this in collaboration with others, you may like to share and compare your theories.

Pages 104–109 of the chapter Knowledge and Theory discuss the various types of theory that educators use to explain how and why people learn and that help them make decisions about how best to support their own and others' learning. It emphasises the fact that theories are dynamic, constantly evolving in the light of new information, and that we do not have a single comprehensive theory of learning. Some theories, however, have become generally accepted by a large number of people over time, and some of those are briefly introduced in this appendix.

Essentially, learning theories fall into two main areas of thought: behaviourism and constructivism. However, because theories grow and evolve, it can be difficult to decide whether a particular theorist is a constructivist or a behaviourist, as is exemplified in the case of Albert Bandura (see below). In practice, different theories have value and relevance in different situations and with different learners.

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## Behaviourism

Behaviourists emphasise the role of the environment in directing behaviour. They work by observing the ways in which their subjects respond to stimuli. They believe that learning takes place through conditioning and describe two types: classical and operant. Papalia and Olds (1992) define them as follows:

- *Classical conditioning*: A form of learning in which a previously neutral stimulus (a neutral stimulus is one that does not elicit a particular response) acquires the power to elicit a response after the stimulus is repeatedly associated with another stimulus that ordinarily does elicit the response (page 556);
- *Operant (instrumental) conditioning*: A form of learning in which a response continues to be made because it has been reinforced or stops being made because it has been punished; also called *instrumental conditioning*, because the learner is instrumental in changing the environment to bring about either reinforcement or punishment (page 560).

Of these two models of learning, operant conditioning is most widely applied to education, though its focus on using reinforcement or punishment to increase, eliminate, shape, or improve behaviour raises ethical issues. Bruning, Schraw, and Ronning (1999) claim that:

*Much of what we do today in education reflects behaviorism's continuing influence. For instance, behavioral features are readily recognizable in such familiar educational approaches as instructional objectives, task analysis, and the use of positive reinforcers. All evolved out of a behavioral philosophy of learning specifying that responses must be sequenced appropriately, made overtly, and rewarded. Many of these derivations from behavioral psychology have helped make education more effective, more accountable, and more humane. In special education settings, especially, behavioral principles have provided an effective set of technologies for teaching that simply did not exist before.*

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## Social learning theory

Social learning theory is closely associated with the prominent theorist Albert Bandura. Bandura illustrated that much learning occurs through the observation and imitation of models and that it can be maintained through reinforcement. This means that instruction can be made more efficient by *modelling* desired behaviours of functional value to learners and by providing situations that allow them to use or practise those behaviours to improve their retention.

While social learning theory has its roots in behaviourism, Bandura found that a simple focus on stimulus and response was too simplistic to explain the complexity of human thought and behaviour. He recognised that the social context of learning is important and that individuals influence their environment as well as being moulded by it. Over thirty years of research, he also became increasingly aware of the role of cognition in learning, understanding that people's cognitive processes allow them to, for example, pay attention to models, use symbols to stand in for a model's behaviour, and mentally organise and reorganise information. This means that his theories also belong in the constructivist learning category described below. These ideas are reflected in the concept of *reciprocal determinism*, which suggests that learning results from the interaction between three factors:

*Personal factors include beliefs and attitudes that affect learning, especially in response to behavioral and environmental stimuli. Behavioral factors include the responses one makes in a given situation – for example, whether one responds to a poor test score with anger or with increased effort. Environmental factors include the role played by parents, teachers, and peers.*

Bruning et al., 1999, page 129

Another important concept developed by Bandura and his fellow social learning theorists is that of *self-efficacy*. This suggests that people are more likely to engage in certain behaviours when they believe they are capable of executing those behaviours successfully. Self-efficacy is closely linked with initial task engagement, persistence, and successful performance.



## Constructivism

Constructivism is a new term for an old set of ideas that are being given renewed attention with the support of recent research in *cognitive psychology*. Bruning et al. (1999) offer the following definition of cognitive psychology:

*Cognitive psychology is a theoretical perspective that focuses on understanding human perception, thought, and memory. It portrays learners as active processors of information – a metaphor borrowed from the computer world – and assigns critical roles to the knowledge and perspective students bring to their learning. What learners do to enrich information, in the view of cognitive psychology, determines the level of understanding they ultimately achieve.*

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Bruning et al. identify six themes in cognitive psychology that have relevance for education:

1. Cognitive psychology helps us see learning as a constructive, not a receptive, process.
2. Cognitive psychology emphasises the importance of structuring knowledge.
3. Cognitive psychology emphasises self-awareness and self-regulation of cognition.
4. Motivation and beliefs direct learning.
5. Cognitive psychology stresses the role of social interaction in cognitive development.
6. Cognitive psychology stresses the contextual nature of knowledge, strategies, and expertise.

Essentially, constructivists believe that learners construct knowledge for themselves; that is, each learner individually (and socially) constructs meaning as he or she learns. As Bruning et al. explain:

*The aim of teaching, from a constructivist perspective, is not so much to transmit information, but rather to encourage knowledge formation and metacognitive processes for judging, organizing, and acquiring new information.*

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The text below describes the work of some key initial theorists in the constructivist tradition and then that of others whose work builds on the concepts they developed.

## Key initial theorists

### Personal constructivism: Piaget

Beginning in the 1920s, Jean Piaget began to develop a cognitive theory of development. Cognitive theorists believe that learning is based on *cognitive schemata* or mental structures by which people organise their perceptions of their environment. Learning takes place through learners' active participation in problem solving and critical thinking around a learning activity that they find relevant and engaging. They construct their schemata by testing new information against their prior knowledge, applying this information to a new situation, and then integrating the new knowledge with their pre-existing intellectual constructs. Piaget suggested that these cognitive structures develop through three inborn, interrelated *principles of development*:

- *organisation*: people's tendency to create systems through which they can make sense of their world;
- *adaptation*: the way a person deals with new information, which takes place through the processes of assimilation and accommodation:
  - assimilation involves interpreting events in terms of the person's existing cognitive structure
  - accommodation involves changing the cognitive structure to make sense of the environment;
- *equilibration*: the tendency for a person to strive for a state of mental balance between him- or herself and the outside world and among the cognitive elements within him- or herself.

Piaget's careful observations of children led him to conclude that they go through distinct stages in cognitive development and that each stage provides them with a new set of mental tools with which to process information. According to his *cognitive-stage learning theory*, there are four stages: sensorimotor, pre-operations, concrete operations, and formal operations.

### Social constructivism: Vygotsky and Bruner

Contemporary notions of social constructivism derive from the work of Vygotsky and Bruner. Where Piaget emphasised learning as an internal process, Lev Vygotsky stressed environmental, social, and cultural influences. His *social development theory* is based on the ideas that human learning is dependent on the learner's interaction with his or her social and cultural environment and that learners are active participants in their own learning. He theorised that a person's level of learning is more accurately reflected by what they can do with help and that, in fact, learning leads development. He introduced the concept of the *zone of proximal development* – the level at which learners can almost – but not quite – complete a task on their own. Vygotsky claimed that learning occurs through interactions between a learner and an expert within this zone. An associated concept is that of the *more knowledgeable other*. This is a person who has more knowledge about the topic being learned than the learner does. Often this person will be a teacher or another older adult, but it may also be a peer or a younger person.

Jerome Bruner applied the metaphor of scaffolds to Vygotsky's concept of the zone of proximal development to develop the concept of *scaffolding* – the temporary support that a more knowledgeable other gives a learner to construct and extend his or her skills. As the learner gains competence, the support is gradually removed.

## Building on earlier ideas

### Co-construction theory

McNaughton (1995) describes co-construction theory as a contemporary view of learning that draws on cognitive psychology in its assumption that learners actively construct knowledge by confronting and solving problems and on social learning theories in its assumption that learning and development are social and cultural processes as well as personal. In addition, he identifies the following three concepts as underpinning co-construction:

- Learners' construction of knowledge and expertise in action is created first in and through social interactions.
- Each learner brings his or her own expertise and shares it with others at the same time as developing new expertise, and so the process of construction is an interactive one. Cultural and social meanings are expressed and constructed within these interactions.
- The process of knowledge construction is channelled by the learner's own development and the significant others in his or her life.

*That is, the environment within which development takes place is organised or structured. Particular activities take place, which have been selected and deployed. The activities which the learner selects and engages in also contribute to the channelling of their own development.*

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### Experiential learning

Experiential learning theorists, such as Carl Rogers and David Kolb, emphasise the importance of actually doing a task in order to learn it and are interested in the ways in which experiences motivate individuals and facilitate learning. They believe that people have a natural inclination to learn in order to change and grow. Learning must address the needs and wants of the learner and take place in an environment where threat is reduced to a minimum. Theories about experiential learning are important components of change management theory. Experiential learning theorists envisage "a dynamic situation where new learning feeds into and influences existing learning environments, thereby creating a process of continuing change" (Mahar and Harford, 2004, page 9).

### Situated learning

Situated learning theories help to explain why it is that professional learning seems to be most effective when it takes place through interactions within and across professional learning communities. (See Appendix II: Professional Learning Communities.)

Situated cognition theorists conceive of learning as a sociocultural phenomenon rather than as the action of an individual acquiring general information from a decontextualised body of knowledge. They take into account the physical environment (the setting), the people involved in the setting (the social group), as well as the purposes of the learning and the resources available. They argue that new knowledge and skills are best learned in contexts that reflect how that knowledge is obtained and applied in everyday situations. Two terms describe the communities in which people participate and through which they learn.

The term *communities of practice* describes people who interact with each other on a regular basis as they carry out a joint activity. They learn how to get better at doing that activity through regular interaction. This community is not merely a club of friends or a network of connections between people; it has an identity defined by a shared domain of interest. Membership means a commitment to the domain and therefore a shared competence that distinguishes members from other people. In pursuing their interest in their domain, members engage in joint activities and discussions, help each other, and share information. They build relationships that enable them to learn from each other.

*Members of a community of practice are practitioners. They develop a shared repertoire of resources: experiences, stories, tools, ways of addressing recurring problems – in short a shared practice. This takes time and sustained interaction.*

Wenger, 2004

Ovens (2002) points out that:

*Communities can be large or small, layered within other broader communities as well as overlapping. It is also typical for individuals to recognize themselves as participants in a variety of communities, simultaneously and with the possibly conflicting connections.*

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For example, an educator may simultaneously belong to an ISTE community of practice, a school community of practice, a school syndicate community of practice, and an informal but influential community of practice made up of friends. Learning can take place through social interaction at both the core and at the boundaries of each of those communities.

The second term is *discourse community*. The concept of “discourse” relates to the ways people have learned to communicate and make meaning of their world. Discourse communities are created by the collective practices of their contributing members and provide “the cognitive tools – ideas, theories, and concepts – that individuals appropriate as their own through their personal efforts to make sense of experiences” (Putnam and Borko, 2000, page 5). It is impossible to participate in any functional group or community without understanding and, to some extent adhering to, the linguistic, intellectual, social, cultural, and behavioural norms of that group. In other words, learning includes coming to understand the ways in which the members of a particular community have developed for making meaning together.

*A “discourse community” is a group of individuals bound by a common interest who communicate through approved channels and whose discourse is regulated ... (The community) shares assumptions about what objects are appropriate for examination and discussion, what operating functions are performed on those objects, what constitutes “evidence” and “validity” and what formal conventions are followed.*

Porter, 1992, pages 38–39

Vincini (2003) suggests that situated learning theories have the following consequences for the design of instruction.

- *Learning is driven and best presented through realistic and complex problems that allow learners to learn to think and practice like experts in the field.*
- *Content is learned through activities that help solve the problems and not from “packages” of information organized by instructors.*
- *The instructor’s role moves from providing and structuring the information and knowledge through lectures and presentations to modeling, coaching, and scaffolding learners as they use information and create knowledge to solve contextual real-life problems.*
- *Situated learning environments must support active engagement, discussion, evaluation and effective thinking. Activities and assignments are often collaborative and group-based.*

page 1

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## Adult learning

Many of the theories described above derive primarily from investigations into the way children learn. Since the mid-twentieth century, people working in the field of adult education have turned their attention to how learning in adulthood could be distinguished from learning in childhood. A number of frameworks and models have emerged, including self-directed learning, transformative learning, and andragogy. Each contributes to our understanding of adult learning but andragogy, a theory developed by Malcolm Knowles, is best known. Knowles used the term *andragogy* to clearly distinguish his theory from that of pedagogy – the teaching and learning of children (Merriam, 2005). He based andragogy on the following assumptions about the characteristics of adult learners.

1. *Self-concept: As a person matures his self-concept moves from one of being a dependent personality toward one of being a self-directed human being.*
2. *Experience: As a person matures he accumulates a growing reservoir of experience that becomes an increasing resource for learning.*
3. *Readiness to learn: As a person matures his readiness to learn becomes oriented increasingly to the developmental tasks of his social roles.*
4. *Orientation to learning: As a person matures his time perspective changes from one of postponed application of knowledge to immediacy of application, and accordingly his orientation toward learning shifts from one of subject-centredness to one of problem-centredness.*
5. *Motivation to learn: As a person matures the motivation to learn is internal.*

Knowles, 1984, page 12

The following principles of adult learning flow from these assumptions:

1. Adults need to be involved in planning and evaluating their instruction.
2. Experience (including mistakes) provides the basis for learning activities.
3. Adults are most interested in learning subjects that have immediate relevance to their jobs or personal lives.
4. Adult learning is problem-centered rather than content-oriented.

Adapted from The Theories into Practice database

Andragogy is more contentious than the other learning theories outlined above. As Merriam (2001) explains, there is debate over:

- whether andragogy provides a theoretical framework for considering adult learning or whether it is simply a set of assumptions and principles;
- the extent to which the assumptions are characteristic of adult learners only.

Despite this, Merriam and Caffarella (1999) report that in practice, practitioners have found andragogy “an enduring model for understanding certain aspects of adult learning” (page 277).

## An emerging theory of teacher professional learning

In the *Teacher Professional Learning and Development: Best Evidence Synthesis Iteration*, Timperley, Wilson, Barrar, and Fung (2007) examine the “black box” between professional learning opportunities for teachers and their impact on teacher practice and subsequent student outcomes. They develop a theory of teacher professional learning that synthesises the aspects of constructivist theory described above, with the exception of adult learning theory. Timperley et al. assume that learning is not significantly different for adults than for students. They do, however, take into account obvious situational differences, such as adults’ richer life experiences, their different learning contexts, and the greater need for adult learners to be convinced that the learning is worth their while.

Timperley et al. identify four learning processes and associated outcomes that come into play when teachers develop new understandings and skills. They describe the processes as “iterative” because “deeper learning typically requires repeated cycles of engagement with learning processes, practice and outcomes” (page 8). While Timperley et al. refer specifically to teachers, it seems fair to assume that the same processes and associated outcomes also apply to ISTE and other educators.

The learning processes engaged when developing new understandings and skills involve cycles of (one or more of) the following:

- **Process 1:** Cueing and retrieving prior knowledge  
*Outcome:* Prior knowledge is consolidated and/or examined.
- **Process 2:** Becoming aware of new information/skills and integrating them into current values and beliefs system  
*Outcome:* New knowledge is adopted or adapted.
- **Process 3:** Creating dissonance with current position (values and beliefs)  
*Outcome:* Dissonance is resolved (accepted/rejected); current values and beliefs system are repositioned or reconstructed.
- **Process 4:** Developing self-regulated learning in relation to testing the efficacy of teaching for student learning  
*Outcome:* Student outcomes are monitored and teaching practice adjusted to maximise effectiveness.

Process 1 lays the foundation for Processes 2 and 3. If teachers are to negotiate the meaning of new knowledge, they first need to engage with their prior knowledge and examine their theories of practice. Sometimes, the new knowledge will be consistent with their current understanding and values (Process 2), and at other times, it will conflict (Process 3).

Process 2 involves developing an awareness of new information that does not create dissonance with current understandings and perceptions of practice. It can result in substantive learning when two sets of conditions are met:

- cognitively oriented conditions, which relate to the importance of understanding the complex ways in which people construct new learning, including the powerful impact of current understandings;
- social and emotional conditions, which include the need to understand the emotional effect of expectations to change practices and the need to motivate teachers to engage in new learning by showing them its relevance to their day-to-day teaching practice.

Process 3 involves new information that creates a sense of dissonance for teachers by challenging their existing values and beliefs. It requires ways of helping them to make their tacit knowledge and theories explicit and to deconstruct and reconstruct them in order to achieve better outcomes for their students. Timperley et al. emphasise the effort that this takes:

*While explicit knowledge is articulated in formal language and, therefore, more easily expressed, tacit knowledge is often intuitive, involving such intangible factors as personal beliefs, perspectives, and value systems, and it may never have been articulated (Lam, 2000; Hannay, Mahony, & MacFarlane, 2004; Jarvis, 1997). Tacit knowledge is built up over time and embedded in personal experience. It is accepted because it is known to work, but it can be a deterrent to creating change because it is often unexamined and unquestioned.*

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Process 4 involves the development of self-regulated learning that requires teachers to test the efficacy of their teaching in terms of its impact on student learning and to monitor and adjust their practice as they work towards clearly defined student outcomes. Timperley et al. found that such learning was a factor in the small number of studies providing evidence that gains in student achievement were improved or maintained after the withdrawal of intensive support from ISTE's external to the schools. Acknowledging the importance of the social situatedness of learning and the need for teachers to take collective accountability for student outcomes, Timperley et al. integrate the concept of "self-regulation" with that of "co-regulation". Along with a range of other understandings about how people learn, these concepts form the basis for their development of the TPLD BES's "Teacher inquiry and knowledge-building cycle to promote student outcomes" diagram.

The theory of teacher learning that Timperley et al. propose is richly informed by their understanding of a wide range of established learning theories and of the ways in which these theories have informed other educational research. For example, Processes 1 and 2 might be traced back to the work of cognitive theorists such as Piaget and their explanations of the way in which learning involves the construction and reconstruction of schemata in the light of new information. The theory of teacher learning is informed, too, by Robinson and Lai's (2006) recent work about the importance of interrupting teachers' normal routines to engage and examine the theories of action that they bring to solving problems of practice. The concept of "theories of action" was itself developed by Argyris and Schön (1974), and that, in turn, grew out of earlier research by Chris Argyris into the relationships between individuals and organisations (Smith, 2001).

Despite this rich heritage, it is essential to heed Timperley et al.'s own warning that while their theoretical framework proved adequate for their purposes, more work is needed before it can be accepted into the body of established theory.

## Conclusion

This discussion has provided a brief introduction to just some of the more influential general learning theories. It is important to remember that each has its critics and adherents. As the final discussion about Timperley et al.'s proposed model of teacher learning emphasises, it seems that educators will get a better understanding of human learning processes by considering a wide range of learning theories and their relevance in different contexts rather than by holding rigidly to any one theory. Some of the texts listed in the References could provide a useful starting point for finding out more about some of the theories with which you are less familiar.

While this appendix is not intended to provide a comprehensive introduction to any of the learning theories it discusses, it may have provoked ideas, questions, or memories. You may like to make a note of these for further investigation or discussion with your colleagues.



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