# Introduction

This review explores the NSW Department of Education’s *Learning Modes for Future-Focused Learning*, a set of organising principles to account for different ways in which learning occurs and describe how learners and teachers interact with space and with one another. Each learning mode is examined with reference to: (1) key characteristics that define effective learning with the mode; (2) the theoretical orientation of learning with the mode and how it has shaped contemporary thinking; (3) alignment between the learning mode and calls for development of future work-related knowledge, skills, and dispositions; and (4) high impact strategies and key factors that support successful learning associated with the mode. A table summary at the end of the document shows how these four components are mapped to each mode.

## Collaboration

Collaboration is often viewed as a philosophy of learning that involves sharing knowledge, experiences, and agency, with students teaching and learning from one another while developing positive interdependencies. In contemporary classrooms and workplaces, collaboration is often said to play a vital role in ideation, solving complex problems, developing collective intelligence, increasing confidence, and fostering positive interpersonal skills and dispositions. It is often allied with group work and justified in terms of desirable future work skills. Authentic collaboration involves students working together on a common task towards shared goals and is often viewed as being embodied in work that represents the ideas and efforts of more than one learner and more than the sum of its parts.

The theoretical roots of collaborative learning stem from socio-constructivist viewpoints. Theorising learning as occurring on both inter-psychological and intra-psychological planes, Vygotsky (1987) idealised collaboration through adult guidance and/or with more capable peers. Arguing for its value in developing independence and autonomy, he stated “what the child is able to do in collaboration today, [she/]he will be able to do independently tomorrow” (p. 211). Social constructivism has since been widely recognised as a basis for exploring knowledge building through collaboration.

Recent analysis very clearly shows that the interpersonal qualities that underpin collaboration are likely to be in strong demand in the future and will be a necessary factor for sustained innovation nationally and globally. As OECD explains (2018), “Increasingly, innovation springs not from individuals thinking and working alone, but through cooperation and collaboration with others to draw on existing knowledge to create new knowledge” (p. 5). In their discussion of future work skills, Davies, Fidler, and Gorbis (2011) predict a significant increase in virtual collaboration as the way employees will work together and emphasise the need for socially intelligent employees who “are able to quickly assess the emotions of those around them and adapt their words, tone and gestures accordingly… [which will be] more important as we are called on to collaborate with larger groups of people in different settings” (p. 8). Foundation for Young Australians (2017) cites a 19% increase in employers’ emphases on teamwork in many current and future jobs and believe that the automation of many low-skilled jobs will lead to much greater focus on “communicators and engagers… [who are] good at working with people to succeed in their future job” (p. 16). In their modelling of the future Australian workforce, PwC’s (2015) list of jobs with low likelihood of automation are in fields where collaboration is a requirement, such as education, healthcare, and medicine. Their report also identifies large-scale collaboration strategies such as crowdsourcing as a major source of innovation.

Drawing on decades of research, Hattie’s (2019) most recent meta-analysis identifies a number of related high-impact strategies and factors for effective collaboration, including:

* cooperative learning — developing positive interdependence, belonging, and wellbeing through peer learning, shared problem-solving, and a range of cooperative classroom structures.
* peer tutoring — teaching self-regulation and control over learning, teaching students to become their own teachers; peer tutors understanding material at a deeper level to be effective teachers.
* small group learning — assigning tasks to small groups, teaching group work skills (or students having prior experience), employing cooperative learning strategies, and adapting content to ability groupings when they are used.
* positive peer influences — building a classroom culture where students are influenced by their peers to undertake prosocial actions.
* teacher-student relationships — building positive relationships with students by developing their agency, efficacy, and respectfully recognising what the child brings to the class; practising the skills of active listening, empathy, caring, and having a positive regard for others.
* strong classroom cohesion — fostering a sense that all (teachers and students) are working towards positive learning gains by employing goal directedness, positive interpersonal relations, and social support.

## Discussion

In many learning environments, discussion is seen as an integral lesson component, taking place in a range of configurations such as whole-class, small-group, and pairs while occurring at any stage of the learning sequence. High quality classroom discussion encompasses effective listening and speaking skills and is sometimes purposefully structured to develop students’ understanding of key concepts, empathy towards others, ability to reason, and/or capacity for critical thinking. Theoretically, discussion is seen as ideally occurring in the form of meaningful dialogue. Contemporary strategies such as Socratic discussion are in fact derived from Platonic texts written in Ancient times with Socrates as a central figure speaking in often lengthy dialogue with others to find the extent of value and truth in their opinions.

Educational theorists such as Dewey and Piaget embraced dialogue as a vehicle for bridging inter- and intra-psychological planes whereby students learn effective cognitive processes through external discussion with others that are then internalised and play a pivotal role in supporting autonomous learning and learner-led inquiry. Dewey (1916) described this bridging process as “the discussion which at first took place by bringing ideas from different persons into contact…. [becoming] a habit of the individual with themselves” (p. 195). As Murphy, Wilkinson, Soter and Hennessy (2011) elaborate:

Discussion plays a very important role in the development of logical thought… [and] embodies the very process whereby ideas are brought together and shaken-up and their viability is tested. This testing of ideas encourages doubt and inquiry on the part of the discussion participants… participants—as a consequence of participating in this meaning-making experience—internalize the process, and thereafter are able to have such discussions within their own consciousness (p. 433).

In education, the concepts of *dialogic discourse*, *dialogic literacy*, and *dialogic pedagogy* all extend from dialogue as an educative process. Bereiter and Scardamalia (2005) explain that when dialogue is open-ended, the learning goal often “evolves or emerges as the dialogue proceeds… [and] the ability to sustain this open-ended yet goal directed character would seem to be a hallmark of dialogic literacy” (p. 13).

Like collaboration, discussion encompasses a range of interpersonal qualities that are perceived as necessary for future employment in a rapidly changing world. However, recent analysis also underscores the importance of critical thinking as a skill of increasing importance and suggests that discussion plays an important part in the development of this skill. OECD (2018) believes that interpersonal connections are key when navigating “through uncertainty, across a wide variety of contexts in time, social space, and digital space” (p. 5) while Davies, Fidler, and Gorbis (2011) similarly propose the future work skill of sense-making as the “ability to determine the deeper meaning or significance of what is being expressed” (p.8). Foundation for Young Australians (2017) highlights “the need for judgment and critical thinking at work — such as coming up with innovative ways of doing things differently and experimenting with new ideas and testing hypotheses” (p. 16). Both PwC (2015) and the Office of the Chief Scientist (2016) stress the importance of developing critical thinking, problem solving, and analytic capabilities within a STEM context while arguing that communication skills acquired through scientific discussion and debate are equally essential in a wide range of STEM and non-STEM occupations. Innovation and Science Australia (2017) similarly points to a likely increase of “interaction jobs [that] involve more complex human interactions and judgements… [and] will account for 60% of the workforce by 2030”, further arguing that “success will require workers to have the ability to communicate and empathise with other workers and customers” (p. 11, 13).

In Hattie’s (2012) revised meta-analysis, classroom discussion emerged as the seventh-ranked high impact strategy (*d*=0.82) and is considered particularly powerful as an enabler of high-quality feedback. Other strategies encompassed in the author’s (2019) most recent research that relate to discussion include:

* questioning — the posing of factual or conceptual questions to students
* elaborative interrogation — calling for students to generate explanations for explicitly stated facts by asking a range of “why” questions
* jigsaw method – the introduction of a main topic and several subtopics, assigning expert groups to subtopics; students study their subtopic through research and discussion; students report findings back to the class and/or home groups.
* philosophy in schools — teaching students reasoning and argumentative skills
* teaching communication skills and strategies — explicit teaching of communication skills and strategies.
* inductive teaching — encouraging students to reason from observation, or to move logically from observing, testing, and comparing to articulating broad principles.
* classroom cohesion — developing a sense that teachers and students are working together towards positive learning goals
* positive peer influences — building an awareness of positive influences peers can have on others’ learning.

## Feedback and Reflection

Although they are grouped in one learning mode, research shows that feedback and reflection are two distinct and separately theoretically grounded concepts. At the same time, they are two concepts that share much in terms of process and outcomes. On the one hand, feedback is seen as an iterative and cyclical part of the learning process — information that is routed back as an input from cause-and-effect events that form a circuit or loop. Feedback is ideally both regular and immediate, and students receive feedback from teachers, their peers, and other physical and non-physical elements within the learning environment. Feedback can manifest in a wide range of ways such as through spoken dialogue, writing, haptic—or other sensory—forms of stimulation, body language, and so on. On the other hand, reflection usually involves students exercising introspection to more fully understand their learning experiences. Reflections could be focused on any aspect of the learning, such as the extent to which ideas explored in one context might be true in others, or what the learning experience tells the learner about themselves. Although reflection is often explicitly implemented at the end of a learning sequence, students can undertake reflection at any stage of the sequence.

Feedback is most often theoretically grounded in social constructivism. Vygotsky (1978) argued that both peer and corrective feedback were essential for developing the learner’s zone of proximal development (ZPD), a tool that he believed “permits us to delineate the child’s immediate future and his[/her] dynamic developmental state, allowing not only for what already has been achieved developmentally but also for what is in the course of maturing” (p. 87). When examined in the context of the ZPD, feedback provides an essential bridge between these two developmental states. Hattie and Timperley (2007) conceptualise feedback as “information provided by an agent (for example, teacher, peer, book, self, experience) regarding aspects of one’s performance or understanding… thus a ‘consequence’ of performance” (p. 81). Based on several meta-analyses, they conclude that feedback has an overwhelmingly positive impact on learning but qualify that it must meaningfully address three groups of questions: (1) Where am I going / What are the goals? (2) How am I going / What progress is being made towards the goals? and (3) Where to next? / What activities need to be undertaken to make better progress? According to the authors, these three question groups respectively reflect three types of feedback: *feed up, feedback,* and *feed forward*.

Dewey (1938a) is often seen as the first notable educator to fully explore the educational significance of reflection in modern Western education. He presents a four-stage process that emphasises the important relationship between experience and action. The first three stages of reflection all pertain to experience. Stages 1 and 2 involve *presence* to experience and *description* of experience, while Stage 3 involves *analysis* of experience. These three stages culminate in Stage 4, “intelligent action,” which represents a kind of informed practice through changed attitudes or perspectives. Dewey sees the process as cyclical and iterative. In this way, reflection does not, strictly speaking, happen at the end of a learning experience; however, it is an important tool for future activity:

Through reflection, what an individual has learned in the way of knowledge and skill in one situation becomes an instrument of understanding and dealing effectively with the situations which follow. The process goes on as long as life and learning continue (1938a, p. 44).

Others have since built on Dewey’s theories in exploring how knowledge acquired through the process of reflection can best inform future practice. In particular, Schön (1995) presents two key concepts, “knowing-in-action” and “reflection-in-action,” both of which describe how experience can be interpreted while the learning experience is undertaken. As Hatton and Smith (1995) summarise, “Dewey himself also spoke of ‘reflective action’ presumably addressing the implementation of solutions once problems had been thought through, and it is clear that most [reflective] writers are concerned with the complete-cycle of professional ‘doing’ coupled with reflection which then leads to modified action” (p. 34).

As some jobs become automated, analysis suggests non-automated work is likely to substantially incorporate feedback and reflection as two very important strategies for future innovation. OECD (2018) argues strongly for the development of reflective practice as a future work skill tied to “the ability to take a critical stance when deciding, choosing and acting, by stepping back from what is known or assumed and looking at a situation from other, different perspectives” (p. 6). Foundation for Young Australians (2017) identifies the likelihood that future jobs will involve substantially less time spent on administration and more time on activities such as feedback and reflection when working with others, such as during weekly team meetings. In their conception of future work skills, Davies, Fidler, and Gorbis (2011) highlight a range of competencies that require strong metacognitive awareness—drawing on reflection—such as sense-making, novel and adaptive thinking, a design mindset, and cognitive load management.

Hattie’s (2019) research suggests several strategies and factors can be linked to feedback and reflection, including:

* clear goal intentions — linking goal intentions to plans to overcome expected obstacles.
* self-reported grades — students assessing the quality of their own work or their level of mastery over a given subject domain
* self-judgement and reflection — cultivating in students the ability to dispassionately apply established standards to their own work; developing students’ ability to reflect on their work, discern its relationship to established standards, and make self-judgements
* positive self-concept — fostering a sense of confidence and the development of a positive sense of self through cognitive appraisals, acceptance of feedback, benchmarking to difficult goals, and comparison to subject criteria (and not other students)
* prior achievement — developing reflection tasks that encourage students to integrate prior knowledge with present learning activities
* self-efficacy — developing students’ confidence and positive self-perceptions through regular feedback and/or reflection.

## Guided

*Guided* is an adjective that broadly describes learning taking place with some form of expert guidance. Although the expert is often conceptualised as a more knowledgeable person—such as a competent peer, the teacher, or an outside expert—guided learning increasingly refers to other systems that provide expertise indirectly, such as a technology-based simulation, dataset, or virtual guided tour. Guidance can also arguably be an inherent component of task design, such as a scaffolded assessment task or drill-and-practice exercise.

Guided learning is most often theoretically based on the work of Piaget (1973) and, more specifically, his four stages of cognitive development: (1) the sensorimotor stage (infancy), where intelligence is demonstrated through motor activity without the use of symbols; (2) the pre-operational stage (toddlers and early childhood), where intelligence is demonstrated through the use of symbols, language matures, and memory and imagination are developed; (3) the concrete operational stage (elementary and early adolescence), where intelligence is demonstrated through logical and systematic manipulation of symbols related to concrete objects; and (4) formal operational stage (adolescence and adulthood), where intelligence is demonstrated through the logical use of symbols related to abstract concepts. Piaget’s theory has led to subsequent thinking about how to best guide learners at each stage of development. One of the most explicitly linked approaches to guided learning according to the learner’s cognitive stage has been Piagetian programs, which encourages teachers to “know the ways they [students] think, and how thinking may be constrained by their stages of development… to [inform] how teachers choose materials and tasks, how the concept of difficulty and challenge can be realised in different tasks, and the importance of developing successive and simultaneous thinking” (Hattie, 2009, p. 43).

Analyses of future work skills suggest that guided learning will continue to be important into the future, albeit with an increasing focus on systems-based guidance. PwC (2015) views machine learning as a major source of potential productivity gains by allowing individuals to work with, and learn from, massive amounts of data. Innovation and Science Australia (2017) forecasts that “92 per cent of future jobs will need digital skills, and 45 per cent of jobs will need people who can configure and work confidently with digital systems and technology” (p. 2). Davies, Fidler, and Gorbis (2011) similarly stress the importance of being computationally guided by big data while “understanding that models are only as good as the data feeding them… and not becoming paralysed when lacking an algorithm for every system to guide decision making” (p. 10). At the same time as systems-based guidance develops a stronger presence in future work, there will remain the need for individuals to guide, and be guided by, others. Foundation for Young Australians (2017) estimates that across all future skilled jobs, “the average employee will spend an extra 2 hours per week maintaining relationships with clients and co-workers and having close interactions with other people and 1.5 extra hours on complex reasoning, decision making, and creative tasks” (p. 9).

Hattie’s (2019) research identifies a wide range of influences which could be linked to be guided learning, including a range of bespoke curriculum programs and cognitive strategies. Among these, key examples include:

* Piagetian programs — explicitly choosing materials and designing tasks in accordance with Piagetian stages of cognitive development.
* conceptual change programs — uncovering students’ preconceptions about a particular topic and using various techniques to help students change their conceptual framework.
* cognitive task analysis (CTA) — explicitly targeting key cognitive drivers of the behaviour of people engaged in particular tasks; shaping instructional approaches for inexpert students who require guidance through the learning process.
* scaffolding — establishing, and gradually removing, forms of outside assistance that enable students to complete tasks.
* intelligent tutoring systems — using systems that aim to provide instructional advice on a one-on-one basis, and to develop and test models about the cognitive processes involved in instruction
* parental involvement — active participation by parents in the child’s schooling
* teacher-learner relationships — developing strong relationships that encourage students to view teachers as a guide able to assist them in their learning.

## Explicit

Also referred to as direct instruction, explicit instruction involves the explicit teaching of skills and content to students, often through carefully structured demonstrations, lectures, and presentations. It is sometimes seen as a more traditional approach, historically being suited to large classrooms at a time when access to information was scarce and assessment tended to prioritise declarative and factual forms of knowledge. During the 1970s and 1980s, the wide acceptance of constructivist learning theory in Western education led to an emphasis on student-centred learning, which some saw as opposed to more teacher-centred explicit instruction because of its perceived emphasis on treating students uniformly. Dewey’s (1938b) theories of learner-led inquiry were also used as the basis of a burgeoning focus on inquiry-based learning — again, which some viewed as ideologically opposed to explicit instruction. These opposing viewpoints have resulted in much debate about whether student-centred approaches such as inquiry are superior or inferior to more teacher-centred approaches such as explicit instruction.

In terms of theoretical framing, explicit instruction has occasionally been referred to as *transmissionist* learning, where the teacher simply imparts knowledge and wisdom to students as receptors. However, this theorisation lacks empirical evidence, and current research generally supports the view that learners construct their own conceptual understanding rather than simply receiving understanding from the teacher. A stronger theoretical grounding can be found in cognitivism, which is a psychological approach developed during the 1950s arguing that educational outcomes can be maximised by a more grounded and evidence-informed understanding of mental function. One key area of cognitivism as it applies to learning is the science of long-term memory and the role of education in influencing it. Cognitive scientists Atkinson and Shiffrin (1968) were among the first to explain the relationship between what they conceptualised as the three structural components of the mind: (1) sensory register; (2) short-term store; and (3) long-term store. The authors explain that both the sensory register and short-term memory are fleeting—with information lost in a matter of seconds—but that the short-term memory plays a vital role in moving information to the long-term memory, where it can be stored indefinitely.

In their synthesis of research on explicit instruction, Kirschner, Sweller, and Clark (2006) now famously argue against learner-centred pedagogies that are often seen to endorse minimal guidance in favour of explicit instruction, finding across several decades of research that “controlled experiments almost uniformly indicate that when dealing with novel information, learners should be explicitly shown what to do and how to do it” (p. 79). The authors qualify that altering long-term memory should be the primary goal of any form of instruction: “The architecture of long-term memory provides us with the ultimate justification for instruction. The aim of all instruction is to alter long-term memory. If nothing has changed in long-term memory, nothing has been learned” (p. 77). These findings are somewhat supported by Hattie’s earlier (2009) meta-analysis that found only modest impact for inquiry-based teaching (*d*=0.31; however, this was revised to 0.46 in the most recent analysis) by contrast to direct instruction (*d*=0.59), although he later comments that inquiry can be very effectively supported by explicit instruction: “if you are learning surface level information… then problem-based learning and inquiry-based learning is pretty useless… but if you try to get the kids to build up sufficient knowledge and understanding and vocabulary… that’s the right time and yes, it can work” (Corwin, 2015, np).

Analysis of future work skills arguably implies the continued relevance of explicit instruction in both preparing students for future work and as a strategy with which individuals should be equipped. In terms of students’ preparation for the future, explicit instruction arguably has a role to play in developing both disciplinary STEM knowledge and literacy and numeracy skills. Both Industry and Science Australia (2017) and the Office of the Chief Scientist (2014; 2016) stress the value of strong disciplinary knowledge that is developed through expert instruction. OECD (2018) similarly regards literacy and numeracy as a strong foundation for future success. In terms of work skills, Foundation for Young Australians (2017) believes that future jobs are likely to place considerably more emphasis on written and verbal communication at the same time as forecasting that, “in an average working week, the time spent on tasks requiring advanced technology skills is set to increase by 75 per cent from 4 hours today to 7 hours in 2030” (p. 16). Davies, Fidler, and Gorbis (2011) suggest that “as immersive and visually stimulating presentation of information becomes the norm, workers will need more sophisticated skills to use these tools to engage and persuade their audiences” (p. 10).

Hattie’s meta-analyses (2019) point to several high impact strategies related to explicit instruction. Of note is the relative high impact of literacy and comprehension programs that incorporate explicit instruction, such as phonics instruction (*d*=0.6) standing in contrast to literacy approaches that tend towards less direct instruction, such as whole language (*d*=0.06). Other key examples include:

* clear goal intentions — linking goal intentions to plans to overcome expected obstacles
* comprehensive instructional approaches for teachers — programs that are detailed, well-designed and resource-rich for explicitly supporting instructional approaches such as teaching complex discipline content, improving literacy and numeracy, or improving comprehension
* explicit teaching strategies — employing a series of supports or scaffolds, whereby students are guided through the learning process with clear statements about the purpose and rationale for learning the new skill, clear explanations and demonstrations of the instructional target, and supported practice with feedback until independent mastery has been achieved
* teacher clarity — instruction that demonstrates effective organisation, explanation, examples, and guided practice; clearly communicating the intentions of the lessons (including skills, knowledge, attitudes, and values students need to learn) and success criteria
* teacher credibility — students regarding their teacher as a credible authority based on their perceptions of competence, trustworthiness, and perceived caring
* learning goals vs no goals — having goals in place as opposed to having no goals in place.

## Demonstration

Demonstration is the process of showing something—for example, ideas, concepts, processes, arguments, and visualisations—through reason and/or proof and clarifying with examples, experiments, and steps. Although dating back to Ancient times when philosophers conveyed ideas through definitions of key concepts, principles, and examples, modern science has embraced demonstration to develop scientific thinking, understand scientific processes, test phenomena, and generate new scientific knowledge. Widely used in scientific disciplines, demonstration can also be broadly applicable to any subject area.

Arguably, the best theoretical justifications for the use of educational demonstrations can be found in the work of Vygotsky and Piaget, both of whom believe that teacher intervention can have meaningful impact when instruction is carefully tailored to the developmental stage of the learner to help them grasp difficult concepts. For example, as Vygotsky (1978) explains, “if a child is having difficulty with a problem in arithmetic and the teacher solves it on the blackboard, the child may grasp the solution in an instant. But if the teacher were to solve a problem in higher mathematics, the child would not be able to understand the solution no matter how many times she imitated it (p. 88). Both theorists also promote demonstration as a component of peer teaching, seeing knowledgeable peers as potentially very effective teachers of less able learners. For Vygotsky, demonstration represents a social trigger for the “variety of internal developmental processes that are able to operate only when the child is interacting with people in his environment and in cooperation with his peers” (1978, p. 90). For Piaget, one of the demonstration is embodied in one of the primary goals of education — “to create the possibilities for a child to invent and discover… [not] transmitting structures which may be assimilated at nothing other than the verbal level” (Piaget, 1973, p. 3).

For teachers, demonstration forms an integral part of effective explicit instruction, particularly when it is linked to modelling. As Hattie (2009) explains, “effective teaching occurs when the teacher decides the learning intentions and success criteria, makes them transparent to the students, *demonstrates* them by modelling, evaluates if they understand what they have been told… tying it all together with closure” (p. 236, our emphasis). As a form of demonstration, modelling provides the opportunity to show students examples of products at varying stages of completion and articulate the processes that underpin these products. By extension, demonstration can become a student activity and support meaningful learning when students engage in peer teaching, or when they are asked to show how they know something or how they have worked through a problem. Hattie (2009) identifies peer teaching as a high impact, “powerful” strategy and notes that “the major influence is that it is an excellent method to teach students to become their own teachers… [and it] has many academic and social benefits for both those tutoring and those being tutored” (p. 186-187).

In future, the predicted emphases on communication, interaction, empathy, and other interpersonal skills highlights the role that demonstration might play. Foundation for Young Australians (2017) believes there will be a slight decline in formal teaching but considerable increases to other interpersonal activities such as verbal and written communication, collaboration, consultation, and interpreting information for others. The report predicts changes to roles such as medical practitioners and accountants that will see these roles encompass more of these interpersonal activities with much less time spent on foundational skills and administration. PwC (2015) similarly highlights low automation jobs as ones far more likely to involve interpersonal activities and draw on demonstration-related skills, citing medicine, education, social welfare, advertising, public relations and information technology as fields where these activities will be required. As interpersonal skills continue to grow in importance, individuals across these professions will be able to draw on demonstration to mentor junior colleagues, explain difficult concepts, and engage with industry stakeholders and the wider community.

According to Hattie (2019), high impact strategies associated with demonstration include:

* reciprocal teaching — enabling students to learn and use cognitive strategies such as summarising, questioning, clarifying, and predicting; each student takes a turn at being “the teacher”, leading a dialogue, and checking their understanding of content through questioning and summarising
* inductive teaching — encouraging students to reason from observation, or to move logically from observing, testing, and comparing to articulating broad principles
* concept mapping — creating graphic representations of course content
* teacher clarity — instruction that demonstrates effective organisation, explanation, examples, and guided practice; clearly communicating the intentions of the lessons (including skills, knowledge, attitudes, and values students need to learn) and success criteria.

## Experiential

Experiential learning is the process of learning through experience. Conventionally referred to as hands-on learning—that is, learning through the experience of *doing something*—it often incorporates other approaches such as cooperative learning, inquiry, field-based learning, and learner choice. Ideally, experiential learning is seen as an opportunity to acquire knowledge in a practical context and, as students work practically, to enable their understanding of key concepts and development of problem-solving skills. The role of the teacher in experiential learning is often seen as the guide, sometimes intervening at key points to explicitly instruct students when necessary or model the use of relevant tools.

The concept of learning by doing dates back to Ancient times and the work of Aristotle, who wrote that “it is neither by nature or in defiance of nature that virtues are implanted in us… nature gives us the capacity of receiving them, and that capacity is perfected by habit” (Tucker, 2015, p. 43). In modern Western education, experiential learning is theoretically tied to the work of Lewin, Piaget, and Dewey. Summarising their contribution, Kolb (2014) explains:

Experiential learning theory offers a fundamentally different view of the learning process from that of the behavioural theories of learning based on an empirical epistemology or the more implicit theories of learning that underlie traditional educational methods, methods that for the most part are based on a rational idealist epistemology. From this different perspective emerge some very different prescriptions for the conduct of education, the proper relationship among learning, work, and other life activities, and the creation of knowledge (p. 20)

Contemporary experiential learning encompasses theories from both psychology and philosophy including: (1) Lewin’s field theory, which holds that behaviour is a function of the field that exists at the time behaviour occurs; (2) Piaget’s theory that learning occurs through assimilating new experiences into existing concepts and accommodating existing concepts into new experiences; and (3) Dewey’s pragmatist beliefs that human knowledge represents an adaptive response to the environment and that learning “cannot take place by direct conveyance of beliefs, emotions and knowledge… it takes place through the intermediary of the environment” (1916, p. 12). These theories collectively represent a view of learning as being ideally agentive and learner-led, thus being consistent with constructivist student-centred forms of learning and arguably compatible with a wide range of constructivist strategies and approaches.

In terms of future work skills, it could be argued that most forms of on-the-job learning are likely to embody experiential learning in some form. Davies, Fidler, and Gorbis (2011) refer to the concept of “situational adaptability… [which is] the ability to respond to the unique unexpected circumstances of the moment” (p. 9), while OECD (2018) refers to “the learning compass” as a similar concept for showing “how young people can navigate their lives and their world” (p. 4). Foundation for Young Australians (2017) points to likely increases in experiential learning on the job with implications for how individuals will need to respond and adapt to their environment:

Today’s young people will need to spend more hours learning on the job than ever before. In fact, Australian workers will spend one-third of their hours at work learning, a 30 per cent increase from today. Continuous learning will be part of our everyday engagement in work. Learning on the job will require us all to constantly respond to new information and new technology when making decisions (p. 14).

Hattie’s meta-analyses (2019) suggest several high impact strategies that can be linked to experiential learning, including:

* inquiry-based teaching — students generating questions and seeking to develop
* answers through the accumulation of evidence, asking questions or problems; small-scale investigations, or projects
* transfer strategies — students being able to make a spontaneous, unprompted, and appropriate transfer of a learning or problem-solving strategy from one context to another
* tactile stimulation programs — providing students with tactile stimulation and environment manipulation aimed to increase focus and time-on-task and attention
* positive self-concept — fostering a sense of confidence and the development of a positive sense of self through cognitive appraisals, acceptance of feedback, benchmarking to difficult goals, and comparison to subject criteria (and not other students)
* self-efficacy — developing students’ confidence and positive self-perceptions through regular feedback and/or reflection.

## Independent

Often referred to as autonomous learning, independent learning is viewed as both a means and ends in education. Students who are capable independent learners are often seen as those with effective self-regulation skills, being able to self-organise, manage their time, solve problems independently, and make complex decisions about their learning. Independent learning is sometimes conceptualised as individual, student-led learning — that is, in opposition to other forms of learning such as groupwork, explicit instruction, or class discussion. However, independent learning is frequently closely related to these other forms and sometimes even dependent on them — for example, when students are required to solve a problem independently following a teacher’s explicit instruction. Beyond formal education, independent learning is sometimes viewed synonymously as lifelong learning, encompassing principles of adult learning such as self-direction, voluntary engagement, making sense of past and present experience, and reflective practice.

The theoretical roots of independent learning in Western education can be linked to constructivists such as Dewey, Piaget, Vygotsky, Montessori, and Fröbel. These thinkers advanced student-centred learning as an educational ideal and placed some onus on the teacher as the agent facilitating independence through instruction. Vygotsky (1978) argued that collaboration between the learner and more knowledgeable peers and/or the teacher was the basis of developing learner autonomy, while Dewey’s (1938b) theories of inquiry present open-ended, free inquiry as the ideal form of learning. More recently, Glasser’s (1992) theories of choice and quality curriculum have been readily invoked in both high-performing and underperforming educational contexts to examine psychological reasons behind high and/or low levels of independent learning. The author argues against a coercive curriculum, advocates provision of as much choice as possible, and underscores the need for curriculum content to be meaningful and useful in real life:

We must face the fact that a majority of students, even good ones, believe that much of the present academic curriculum is not worth the effort it takes to learn it. No matter how well the teachers manage them, if students do not find quality in what they are asked to do in their classes, they will not work hard enough to learn the material. The answer is not to try to make them work harder; the answer is to increase the quality of what we ask them to learn (p. 691).

There is compelling evidence to suggest that independent learning will be an essential quality in the future workforce, and principles of learner autonomy, agency, and efficacy are embodied in recent analyses. Foundation for Young Australians (2017) regards independence as a necessary way to work in light of predicted decreases to hours of management, organisational coordination, and teaching. Pointing out that many more people will work externally, the authors believe that “the future workforce will need to be more autonomous and self-directed… [and] will need to manage their own time more, make more decisions about priority and importance of tasks and be more personally motivated and driven” (p. 18). OECD (2018) similarly views agency as fundamental for future readiness, stressing that it “implies a sense of responsibility to participate in the world and, in so doing, to influence people, events and circumstances for the better” (p. 4). The same authors also point out that recent advances in cognitive science point to the plasticity of brain regions and systems related to the development of self-regulation skills during adolescence. Davies, Fidler, and Gorbis (2011) explore self-regulation and metacognition across a number of skills that include cognitive load management, virtual collaboration, and sense-making.

Hattie’s (2019) meta-analyses reveal a relatively large number of strategies that support independent learning

* elaboration and organisation — committing information and skills to memory
* help seeking — adaptively seeking external support for an academic or mental health problem
* deliberate practice — extensively engaging in relevant practice activities in order to improve particular aspects of performance
* working memory strength — the cognitive site in which a person holds and manipulates information for a brief period of time, typically because this information is relevant to a current task
* field independence – fostering a learner’s interest in abstract subject matter, learns individualistically, and thinks through problems impersonally
* positive self-concept — fostering a sense of confidence and the development of a positive sense of self through cognitive appraisals, acceptance of feedback, benchmarking to difficult goals, and comparison to subject criteria (and not other students)
* self-efficacy — developing students’ confidence and positive self-perceptions through regular feedback and/or reflection
* prior achievement — developing reflection tasks that encourage students to integrate prior knowledge with present learning activities
* deep motivation and approach — encouraging students to desire mastery, deeper understanding, or high degree of investment to have a fuller understanding overall of the topic.

# Conclusion

Recent educational policy and research strongly supports the view that there is no one single effective teaching practice and that teachers should be proficient in many practices and able to evaluate their impact on students’ learning (NSW Government, 2013). The NSW Department of Education’s *Learning Modes* represent a set of organising principles for educators to understand the ways that learning and teaching can occur in contemporary classrooms. The aim of this report was to explore how each mode could be conceptualised with recourse to key characteristics, theoretical orientation, future work skills, and high impact strategies. By grounding each of the modes in this deeper context, the report argues that the they embody well-established theories and practices for supporting and empowering learners now and into the future.

## Appendix 1: Synthesis of Learning Modes — characteristics, theory, strategies, and success factors

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Collaboration icon  Collaboration | Discussion icon  Discussion | Feedback and reflection icon  Feedback and Reflection | Guided icon  Guided | Explicit icon  Explicit | Demonstration icon  Demonstration | Experiential icon  Experiential | Independent icon  Independent |
| Characteristics   * sharing knowledge, experiences, agency * developing positive interdependencies * students teaching and learning from one another. | Characteristics   * dialogue as an educative process * vehicle to develop effective speaking and listening skills * can build understanding of key concepts, empathy, ability to reason, and critical thinking skills. | Characteristics   * iterative and cyclical * occurring at any stage in the learning process * informs the learner about key aspects of the learning experience * can manifest in a wide range of forms. | Characteristics   * expert assistance to guide the learning process * can involve people such as peers, the teacher, or outside expert; can be systems-based; can be a feature of task design. | Characteristics   * direct/explicit teaching of skills and content to students * structured demonstrations, lectures, and/or presentations. | Characteristics   * showing something — for example, ideas, concepts, processes, arguments, and visualisations. * widely used in scientific disciplines while being applicable to any discipline. | Characteristics   * learning through experience * an opportunity to acquire knowledge in a practical context. | Characteristics   * learner autonomy * learners able to self-organise, manage their time, solve problems independently, and make complex decisions * lifelong learning. |
| Theory   * socio-constructivism: learning occurring on both intra- and inter-psychological planes. | Theory   * socio-constructivism: cognitive processes externalised through discussion, later internalised. | Theory   * socio-constructivism: developing the learner’s zone of proximal development (ZPD) * pragmatism: presence, description, analysis, and intelligent action. | Theory   * constructivism: understanding stages of cognitive development and designing learning to suit the learner’s stage. | Theory   * cognitivism: understanding and leveraging the science of long-term memory; if long term memory has not been altered, learning has not occurred. | Theory   * constructivism: instruction carefully tailored to the learner’s cognitive stage to help them grasp difficult concepts. | Theory   * cognitivism: behaviour as a function of the field that exists at the time behaviour occurs * pragmatism: knowledge as adaptive response to the environment. | Theory   * constructivism: student-centred learning; learner-led inquiry * choice theory: avoidance of coercive curriculum. |
| Future Work Skills   * virtual collaboration across distances and between larger groups * social intelligence: ability to read emotions and adapt tone, gesture, and actions. | Future Work Skills   * critical thinking and problem solving * sense-making to determine deeper meaning. | Future Work Skills   * prioritising feedback and reflection in team meetings * ability to take critical stance, step back from what is known, see problems differently. | Future Work Skills   * ability to use big data, algorithms, and other systems to guide thinking * maintaining quality relationships with colleagues through close interactions. | Future Work Skills   * ability to engage and persuade audiences * strong written and verbal communication. | Future Work Skills   * ability to consult, interpret information for others, explain, and reason. | Future Work Skills   * ability to learn continuously on the job * ability to navigate uncertainty, situational adaptability. | Future Work Skills   * autonomy, self-direction, and motivation * self-regulation skills such as cognitive load management and time management. |
| Key Strategies   * cooperative learning * peer tutoring * small group learning. | Key Strategies   * questioning * elaborative interrogation * jigsaw method * philosophy in schools * teaching communication skills and strategies * inductive teaching. | Key Strategies   * clear goal intentions * self-reported grades * self-judgement and reflection. | Key Strategies   * Piagetian programs * conceptual change programs * cognitive task analysis * scaffolding * intelligent tutoring systems. | Key Strategies   * clear goal intentions * comprehensive instructional approaches for teachers * explicit teaching strategies. | Key Strategies   * reciprocal teaching * inductive teaching * concept mapping. | Key Strategies   * inquiry-based teaching * transfer strategies * tactile stimulation programs. | Key Strategies   * setting standards for self-judgement * elaboration and organisation * help seeking * deliberate practice. |
| Success Factors   * positive peer influences * strong teacher-learner relationships * well-designed assessment * strong classroom cohesion. | Success Factors   * classroom cohesion * positive peer influences. | Success Factors   * positive self-concept * prior achievement * self-efficacy. | Success Factors   * parental involvement * strong teacher-learner relationships. | Success Factors   * teacher clarity * teacher credibility * learning goals vs no goals. | Success Factors   * teacher clarity. | Success Factors   * positive self-concept * self-efficacy. | Success Factors   * working memory strength * field independence * positive self-concept * self-efficacy * prior achievement * deep motivation and approach. |

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