

Chapter 3: Reflection

Overview

Chapter 1 briefly considered how skilled reflection is critical to becoming an engaged, self-regulated, life-long learner. This chapter looks at the attribute of reflection, and the related concept of learning how to learn, in more detail. It starts by considering what reflection is and exploring its key role in the learning process. It then considers implications for students, teachers and schools. This chapter is closely related to Chapter 4 of the *Developing your School with Cambridge* guide (available at www.cambridgeinternational.org/images/271309-teaching-cambridge-programmes.pdf). A number of useful resources are provided at the end of the chapter that expand on the ideas developed in it.

What is reflection?

Reflection is an active, disciplined and deliberate strategy. It is incorporated into the processes and activities of teaching and learning to help improve understanding. It is, therefore, much more than a review and justification of what has happened at the end of a period or activity.

This chapter considers two closely related types of reflection:

1. Reflecting on what is being learned to support deeper understanding of the material.
2. Making learning itself an object of reflection to support student self-regulation and learning how to learn.

Reflection is necessary for learners to be able to effectively manage complex thinking processes and outcomes. For Dewey (quoted in Moon 1999 p. 12), reflection is an essential part of the process of making meaning that pushes learners from one experience to the next: 'The kind of thinking that consists in turning a subject over in the mind and giving it serious thought.' Reflection is 'active, persistent, and careful consideration of any belief or supposed form of knowledge in the light of the grounds that support it, and the further conclusions to which it tends.'

Reflection helps students to develop a deeper understanding of what they are learning through making new connections and relating different ideas. To Perkins (1992 pp. 77–79), demonstrating understanding involves being able to carry out a number of

“ Cambridge students understand themselves as learners. They are concerned with the processes as well as the products of their learning and develop the awareness and strategies to be lifelong learners. Cambridge teachers are themselves learners, seeking to build on and develop their knowledge and skills through a virtuous circle of reflection on practice – involving research, evaluation and adaptation. They support students to become independent and reflective learners. ”

(Cambridge learner reflective attribute)

performances that both show understanding of a topic and help advance it. Perkins illustrates this in the context of Newton's First Law of Motion (every object in a state of uniform motion tends to remain in that state of motion unless an external force is applied to it). If students are given the opportunity to reflect upon this concept, with appropriate teacher guidance, exploring key ideas and considering their implications, they are then able to:

- explain this law in their own words
- provide further examples of the law at work (exemplify)
- apply the law to new situations and phenomena not yet studied
- offer up evidence in defence of the law (justify)
- note the form of the law and draw from it any further general principles about the physical world (contextualise and generalise).

Critically, the process of reflection is necessary for the above to happen – the ability ('performance') to extrapolate and generalise comes as a consequence of thinking

deliberately and hard about the intended constructs (the important things we want our students to learn) and practising them in relation to different questions. Reflection, therefore, is a critical activity that helps develop deeper understanding of the material being covered.

Because all learning is constructed in learners' minds, learning cannot simply be transmitted from a teacher or a book to the learner. A teacher who is instructing the whole class needs to incorporate reflective strategies and activities into lesson plans as much as a teacher who is overseeing group or practical work. The best whole-class instruction is highly reflective.

The reflective student: learning how to learn

'Effectiveness as a learner hinges on the ability to be versatile as a learner. To have a rich view of learning and a learning orientation which is in turn linked to the ability to plan, monitor and review one's learning' (Watkins, 2010).

Metacognition (thinking about thinking) is a general term to describe the processes involved when learners plan, monitor, evaluate and subsequently make changes to their learning behaviours. Another term developed by Watkins (2010) to convey the very specific idea of reflecting on and regulating learning, is 'metalearning'. We use the two terms interchangeably in this guide.

In 1999, the US Department of Education's Office of Educational Research and Improvement (OERI) commissioned the National Research Council (NRC) to synthesise and review the research literature on the science of human learning. The subsequent report, *How People Learn* (Donovan, Bransford & Pellegrino, 1999), suggested important implications for the design of curricula, teaching, assessments and learning environments. It highlighted three findings that had both a solid research base and strong implications for how students learn and therefore how teachers should teach. These are consistent with the description of constructivism as a theory that explains how learning happens (which we covered in Chapter 1):

1. 'Students come to the classroom with preconceptions about how the world works. If their initial understanding is not engaged, they may fail to grasp the new concepts and information that are taught, or they may learn them for the purposes of a test but revert to their preconceptions outside the classroom.'

2. 'To develop competence in an area of inquiry, students must: a) have a deep foundation of factual knowledge, b) understand facts and ideas in the context of a conceptual framework, and c) organise knowledge in ways that facilitate retrieval and application.'
3. 'A metacognitive approach to instruction can help students learn to take control of their own learning by defining learning goals and monitoring their progress in achieving them.' (Donovan et al, 1999, pp. 10–13)

To ensure students are appropriately challenged and made to think hard, teachers and students need to reflect carefully on where students are in the learning process before learning commences. In this sense, reflection is a carefully structured and disciplined process. It is based on an understanding of the material being learned, the process of learning and the current strengths and limitations of the individual learner in that context.

A metacognitive approach can help students navigate their learning journey. Students reflect upon their thinking, evaluating the success or otherwise of their approaches to learning as they are deployed, and then revising them if need be. It is a habit, incorporating strategies and skills.

Metacognition involves two distinct processes. Metacognitive knowledge is the knowledge the student has about the task in hand, their own cognitive abilities and the learning outcomes or goals. Metacognitive regulation involves a student controlling the cognitive processes and strategies being used as they complete a task, for example, re-reading a passage of text because the meaning was lost first time around (see Flavell, 1976 pp. 231–236). It is quite common for a learner to demonstrate metacognitive knowledge but not be competent at metacognitive regulation. Both are critical.

Swartz and Perkins (1989 pp. 179–183) defined four levels of metacognition:



Figure 2: The reflective learner

Tacit learners are unaware of how they think and learn – they simply accept whether they know something or not and will very likely have barriers (real or otherwise) in the way of their progress and development.

Aware learners know about some of the kinds of thinking they do – they can compare and apply, for example, but are not strategic in their thinking. Again, barriers to learning in the form of misconceptions are prevalent and these learners do not work hard to overcome them.

Strategic learners can organise their thinking by using problem-solving, decision-making, evidence-seeking and other kinds of cognitive strategies to aid their learning. They prove successful where the task or activity is known to them and are able to select an appropriate approach based on prior understanding and knowledge. Where strategic learners can fall down, though, is in situations and contexts that they have not come across before.

At the final level, reflective learners are not only strategic in their thinking but are able to reflect upon their thinking-in-progress, pondering their strategies and revising them as appropriate. They thrive in the unfamiliar or unknown, actively learn from failure or setbacks, and have developed a considerable degree of resilience and determination. Moving from being a tacit to a reflective learner involves 'learning how to learn'.

Learning to learn is concerned with developing the capacity to accurately reflect on one's learning and deliberately apply this understanding to learning in the future. In the words of Watkins (2010) this involves making 'learning an object of learning'. This requires a number of learning habits, strategies and processes incorporating metacognitive knowledge and regulation including:

- self-awareness of how I am learning and how effective my learning is
- identifying and overcoming barriers to learning
- questioning assumptions
- delaying gratification, sticking to a task, enjoying challenges and difficulties
- organising learning effectively
- being willing and able to ask for help, understanding when one's own resources are limited
- learning from mistakes and setbacks
- trying new strategies.

The attitude a learner has towards learning is critical. Effective learners are more likely to be self-regulated and intrinsically motivated. They approach learning in a way that emphasises understanding and retention of learning. Extrinsically motivated students are predominantly driven by rewards and recognition. Deep and strategic learning, what Watkins (2010) terms a *learning orientation*, not only helps students develop the learning skills they will need for further education, life and the world of work, it also helps them perform better in public examinations. This can be a powerful fact in persuading results-orientated parents and students about why reflective learning matters. Learning needs to be made an object of attention, reflection, conversation and evaluation in everything the school does.

For students to effectively regulate their own learning it is important that they understand their performance in relation to what constitutes excellence. They must develop concepts of standards and measure their current performance against these. Students need to understand what good performance at a task looks like and reflect on the implications for them (see Figure 3).

This is not easily achieved and too often reflective activities and processes carried out by teachers and students are superficial. Cognitively demanding tasks require a number of complex skills and sophisticated understandings, and it may be that a student is lacking some basic techniques or has not fully grasped a critical concept. They may not be aware of this and unconsciously have become skilled at disguising these in order to keep up with the class. The art and science of excellent teaching and learning is being able to accurately interrogate performance and deduce real strengths and limitations. Some of the implications for teachers are considered later in this chapter.

Figure 3: Making learning an object of learning



The following case study from a state school in the United States gives an example of a school committed to raising standards through high expectations for all based on

students taking responsibility for their learning. It uses state standards and the Cambridge curriculum to help them develop a mastery of learning.

Case study 8:

Encouraging students to take on responsibility at Parkside Middle School, Virginia, USA

Our overarching goal when becoming a Cambridge International School was to be able to develop and sustain a community in our building that encourages our students to take responsibility for their own learning.

Parkside, unlike many middle schools, is not a community school. All our students come by bus to our school as none of the communities that surround our school service our school district. Therefore, our students arrive to Parkside as 6th graders from five very diverse elementary schools. Many of our students come from homes where their parents are very involved and have high expectations for their students, while others come from homes where their parents are illiterate, and depend on the school to provide their children with an adequate education. With these challenges, Parkside decided that the Cambridge International ethos provided our entire student population with high expectation for all, offered an enriched curriculum, experiencing active learning across all contents and providing students with the opportunity to develop their critical thinking skills, not only in the curriculum but also when dealing with problems in the real world.

The mission of Parkside Middle Cambridge International School, a culturally and technologically rich learning environment, is to inspire and empower all students in a student-focused environment to excel both academically and socially, and prepare them to be productive citizens and future leaders.

All students are encouraged to take responsibility supported by a pledge recited by all students, every morning. The pledge states 'I am responsible for my own learning, I am responsible to the success of the class, I will make a difference.' Many times during the school day, students are reminded of this pledge to guide them with their personal decision making. The emphasis on our students taking an active role in their own learning is the driving force at Parkside.

Our goal is to develop learners who are confident in working with information and ideas (their own and those of others), responsible for themselves, responsible to and respectful of others. We include reflection in our daily practices to encourage students to be reflective as learners, while developing their ability to learn, innovate and be equipped for new and future endeavours.

Virginia has very clear standards of learning that drive our curriculum, therefore in English, Maths and Science, we enrich our curriculum with Cambridge programmes. At Parkside, we believe that it is important that our students (and parents) truly understand the standards that they are expected to master, and that the grades they earn depict this learning. It is important that our students understand the areas where they have strengths as well as weaknesses so they can work alongside their teachers to develop next steps in the educational journey.

All student assessments focus on the development of mastery of learning. Students play an active role in the mastery process. They record their progress in data folders and through the online gradebook maintained by teachers. All grades that are entered in the gradebook are broken down by individual standards, and only summative assessments and projects are included. With that students are expected to re-learn, re-study and re-take all assessments to improve on their learning. Classroom study and homework are viewed as practice opportunities so they do not receive grades. Our vision is to structure learning experiences for our students to be able to take risks in their own learning, and not to see mistakes as failures, but as a way of practising for the goal of mastering the material.

Approaches to teaching and learning that support reflection and learning how to learn

It is important that reflection is fundamental to the day-to-day activities of all teachers, and that it forms part of their lesson planning and practice. Students need to learn to enjoy being made to think hard and actively reflect on learning as it occurs. Powerful approaches and strategies include (all appropriately supported by the teacher):

- making learning goals and assessment criteria explicit, helping students to plan strategies and develop ways of monitoring their progress towards achieving these goals
- involving students in collaborative activities in which they practise articulating their own understandings of the material and reflect on their own performance and learning process
- reciprocal teaching and learning which involves students summarising and presenting to others key ideas, findings and outcomes and/or teaching their peers specific content and skills
- instructional practice which requires students to give explanations of their own understanding of the studied material leading to discussion and questioning
- teaching students self-verbalisation. This helps students to develop a language that enables them to be self-critical evaluators of their own performance and what they are learning
- students assessing their own levels of understanding, effort and strategies on task and peer assessment where students learn to assess each other
- encouraging discussion of strategies in class so that students understand when to use certain strategies, the impact they have on their learning, and why the strategies work

- visible thinking routines. These are an effective way to promote deliberate thinking and to provide a structure to the way students go about the process of learning (see for example Harvard thinking routines at: http://www.visiblethinkingpz.org/VisibleThinking_html_files/03_ThinkingRoutines/03a_ThinkingRoutines.html One example is 'connect, extend and challenge':
 - **Connect:** How are the ideas and information presented connected to what you already know?
 - **Extend:** What new ideas did you get that extended or pushed your thinking in new directions?
 - **Challenge:** What is still challenging or confusing for you to get your mind around? What questions, wonderings or puzzles do you now have?

In a study of metacognition in five and six-year-olds the researcher Larkin (2000) used a coding framework to identify all the metacognitive behaviours she saw when observing both teachers and students. On pages 39 and 40 are two tables summarising the different behaviours and the language used in support of metacognition in the classroom. While based on young children, the examples illustrate styles that are relevant and adaptable for all ages (note that some of the examples have been adjusted for an international audience):

Table 4: Metacognitive talk – teachers

Teacher behaviour and language supportive of metacognition	
Explanation	Example
Refers to self-learning strategies	'What could you do if you've got problems?'
Questions acquisition of knowledge	'How do you know that?'
Teacher prompts regarding information provided	'We found the biggest; what else could we do?'
Teacher aids explanations	'X explained putting the biggest to smallest very well.'
Teacher questions/comments on strategies	'How are you putting them in order?'
Teacher asks for predictions of success	'Will this make it easier?'
Teacher shows expectations of planning	'How are we going to do this; what do we need to think about?'
Teacher expects checking	'Check what you are counting in or the unit of measure.'
Teacher refers to own cognitive processes	'I don't understand it either, so let's have a look together.'
Teacher refers to thinking	'Let's put on our thinking caps.'
Teacher refers to universals of cognition	'We are learning how to solve problems. We are learning to analyse a poem.'
Teacher prompts evaluation	'Was it difficult to do or was it easy?'

Table 5: Metacognitive talk – students

Student behaviour and language supportive of metacognition	
Explanation	Example
Shows knowledge of self in relation to cognition and/or predicts from this.	'I know what to do.' 'Oh I love hard work.'
Refers to what others may think/desire	'She doesn't know.' 'He doesn't want to be last.' 'I think they can help us.'
Refers to universals of cognition	'We've got to solve a problem.' 'I think we need to quote more examples from the poem if we're going to get more marks for "analysis".'
Questions task information and/or seeks clarification	'Something is missing.' 'Can you explain what that means? I think it is important.'
Predicts success/failure	'We'll be finished soon.'
Rating: refers to ease/difficulty of task	'I think this is easy. It won't take us long at all.'
Compares with other tasks	'This is like when we made a model.'
Evaluates: indicates knowledge about what might be useful	'We should build up the boxes.' 'That's the quickest way to do it.'
Refers to planning how to do the task	'We need to know where best to start.' 'We should talk about it together.'
Paraphrases to confirm understanding	'Did you mean...?'
Asks questions of self	'Is that right?'
Checks work	'This one's good, this one's not.'

Reflective learning and study skills

Making learning an object of learning requires learners to develop a sophisticated and accurate understanding of the learning process. Sometimes in schools this is not sufficiently recognised or supported. Students, parents and teachers should think about what learning involves and how it happens, as well as considering how the learner attributes can contribute.

One way of looking at learning is to consider learning efficiency, the amount and quality of learning that takes place over a specified period of time. Improving learning efficiency can result in more being learned, more quickly, more effectively and more deeply. This creates more time for further learning in valued areas across the formal and co-curriculum, and for students to pursue passions and interests.

One example of wasted time and effort that slows down learning efficiency is when students adopt ineffective study habits. Table 6 looks at some of these. The common factor in ineffective study is that it is passive and not targeted or specific enough. Students tend to practise what they already know and can do, and are not sufficiently challenged (the work is too easy) or they cannot access it and get demotivated (the work is too demanding). The revolution that has occurred in high-performance sport towards high-quality, targeted, specific practice based on evidence of performance is relevant to schools.

Table 6: Effective study habits

Misconception and common practice	Reality and more effective practice
<p>In revising for examinations and tests students read the textbook and their notes over and over again trying to memorise everything. Often students are spending time reviewing what they understand already. Students easily get distracted – as revision is passive, their mind can wander with the illusion they are learning.</p>	<p>Students need to focus and practise specific areas of challenge identified by formative assessment and reflection. Revision is more effective when students have to answer questions and note what they can and cannot do well. This provides a clearer focus for further study. This form of revision is active as students are testing their understanding and reflecting on the outcome.</p>
<p>Students copy out their notes over and over and concentrate on factual recall.</p>	<p>Learning is best split into chunks and facts are best learned in connection with the concepts and ideas to which they relate. See the section on mind maps in Chapter 4 on innovation and creativity.</p>
<p>Revision is delayed until a unit test or end-of-year examination. Lessons and units are taught as discrete entities.</p>	<p>Revision and practice should be constant. At the start of every lesson students (supported by teachers) should be made to think of what has been recently learned. Teachers need to build bridges in students' minds between learning in different classes, and students need to practise and practise again new skills and understandings soon after they are learned so that they become deeply embedded.</p> <p>Once a concept is deeply learned and understood it is very hard to forget, making revision before the examination much easier.</p>

Table 6: Effective study habits continued

Misconception and common practice	Reality and more effective practice
Students revise and work alone.	While revision can effectively be done by students alone it does not have to be a solitary activity. Revision can effectively be done as a collaborative activity with students working in pairs or groups. Students can specialise by dividing up the material, testing each other and teaching each other. Note that student reciprocal teaching has a very high effect size in Hattie's (2009) analysis of effective practice.
Once an assignment, examination or test is complete, students do not reflect on what caused their performance to be what it was.	Assignments provide powerful formative learning opportunities. Students can be encouraged to reflect on their performance using specific practices and instruments designed for this purpose. See for example Stanford University's 'exam wrappers' concept: teachingcommons.stanford.edu/teaching-talk/exam-wrappers

Students and teachers can be encouraged to ask a series of reflective questions that help identify the processes of learning that are taking place and link learning activities together. One simple example is in Table 7, right:

Some schools try to support study skills through providing specific, discrete classes or activities as part of a personal and social health curriculum. This can support the development of a learning orientation but will not work unless practices and habits are modelled and supported by all teachers across the curriculum. Learning is highly context specific and cannot be separated from what is being learned. Individuals will have different strengths and limitations in different subject areas, and it is important that they engage with these as they learn new material.

All teachers in the school need to support learning how to learn.

One practice that can work well is to include student self-evaluation in reporting and parent conferences. One example of this is provided in Case study 9 (on the next page), which highlights the focus of parent conferences as 'talking with students about their learning, not talking about a student's work'. The case study also emphasises the value of reflective conversations as part of every teacher's professional development and the role parents play as an active participant in a three-way conference, which exemplifies some of the points made in the following sections of this chapter.

Another tool some schools use is to require students to write learning journals or blogs, or to keep their portfolios of work regularly updated with metacognitive reflections on their learning as it progresses.

Table 7: Nine questions for students to develop metacognitive thinking (adapted from Innerdrive, 2017).

Before the task

1. Is this similar to a previous task?
2. Can I describe in my own words what success in this task will look like?
3. Where is the best place to start?

During the task

4. Am I on the right track?
5. What can I do differently if I'm not?
6. Who can I ask for help? (One strategy: see two classmates before approaching the teacher for help.)

After the task

7. What worked well?
8. What could I have done better?
9. Can I apply or connect this to other situations and learning contexts?

Case study 9:

Reflective learning at United World College South East Asia, Singapore

Reflection as a tool to support learning is widely used in schools, and this has certainly been true at United World College South East Asia (UWCSEA). But perhaps it was only when we as teachers started to use reflective conversations as a tool for our own professional development that we began to see the importance of reflective dialogue to support student learning too.

How we define reflection

Reflection can improve **self-awareness, self-management, thinking and wellbeing** through three phases of reflection:

Awareness phase. In the first phase we look again (as in the metaphor of a mirror) at ourselves. We do this by intentionally creating conditions that allow for heightened awareness of feelings, thoughts, events (actions, achievements, completed tasks, outcomes) or approaches (use of particular strategies, perspectives or thinking during a process). Sometimes reflection might stop here with greater mindful awareness.

Analysis phase. In the second phase we might use thinking routines (protocols, dialogue, mediative questions, prompts etc.) to help us consider causal factors, with the aim of clarifying or understanding our feelings, thinking and mindset. This might be 'thinking' in lots of domains from the cognitive to the affective (moods, feelings, attitudes). Sometimes reflection might stop here with a greater sense of causality, clarity or understanding.

Application phase. In the third phase we might think about the implications or the application of what we have learned during previous phases of reflection. We may try new thinking, new perspectives or modify existing approaches with the help of thinking routines. This might support the development of a growth mindset, enhance self-regulation and support an internal locus of control. (UWCSEA East – reflection guidance)

Example of how we use reflective dialogue with students

Three-way conferences are held twice a year and are attended by high school students, their parents and their teachers. They form one opportunity to support reflective conversations and increase student ownership of the learning and self-directedness.

- Three-way conferences are based in UWCSEA Learning Principles, including:
 - learners use timely and goal-directed feedback
 - learners have ownership of their learning
 - learners think and act upon their learning.
- Three-way conferences encourage development of elements of the UWCSEA Profile including:
 - communicator, self-aware, self-manager, resilience.
- Three-way conferences strengthen open communication about learning between students, parents and teachers. The focus is on talking with students about their learning, not talking about a student's work. It is about developing student voice and then listening to it.

It is through the use of mediative questions used in Cognitive Coaching® that students (and teachers) are encouraged to reflect on their own learning, and to become more self-directed. Mediative questions engage and transform the thinking of a student. They have three characteristics that make them powerful:

1. They are invitational, i.e. they encourage students to think about their learning in a strategic way.
2. They engage specific cognitive operations, e.g. compare, analyse, predict.
3. They are intentional, i.e. they have a deliberate purpose in their structure and use.

Case study 9: continued

Before each three-way conference, students are asked to spend time going through the first phase of reflection for each of their subjects. Parents are asked to consider the student's learning at home and questions they might ask for clarification from the student and the teacher. Teachers consider the sorts of mediative questions they might ask each student to support their analysis of what is helping or hindering their learning. During the three-way conference, students and parents are encouraged to take notes to help with the setting of goals and to support phase three of the reflective process.

The value of reflective conversations to support student learning may best be summarised by one parent's response: 'Feedback to my child was very

motivational. I liked that they did not focus so much on grades but on progress, attitudes and strengths. This is what we teach current leaders – how to motivate people!'

It is our intention to use reflective dialogue to help student and teacher learners think reflectively about their growth and development, to be able to plan future learning and to have a sense of autonomy. The open communication and support of the process has also been helped in building trust within the UWCSEA community.

Examples of questions	Phases of reflection
What might be the skills you contributed most? What did you need to consider when planning? What did you have control over in this situation? What aspects of this unit might have challenged you most?	Awareness
What options did you have when planning? Why was this important to you? How might you have responded if...? What restraints did you have and how did you overcome them?	Analysis
How might your actions have shaped the outcome? How might you consider planning this service differently next time? How might your approach influence other situations or people? Which of your skills did this call for and how might you use them in other situations?	Application

The reflective teacher

For students to be reflective it is essential that teachers model reflective processes themselves and create the right conditions in the classroom through the way in which they plan and deliver their lessons. Teachers need to nurture practices that support metacognitive knowledge and regulation in students. We considered some strategies for this in the previous section. They need to apply the same principles to their own professional practice and become reflective practitioners.

Reflective practice can be described as the process of learning through and from experience, towards gaining new insights of self and practice (Schön, 1983). Schön makes reference to two main processes of reflection in professional practice – reflection-in-action (self-monitoring) and reflection-on-action (an aspect of self-evaluation). He emphasised the former more because he argued that in many professions, there is an absence of a secure body of knowledge: 'Real-world problems don't come well formed. They tend to present themselves, on the contrary, as messy, indeterminate, problematic situations' (Schön, 1992 pp. 49–63).

This is best illustrated in a classroom environment. Students come to the classroom with preconceived ideas about how the world works that teachers do not always immediately recognise or understand. Teachers need to be able respond quickly to what they learn about student understanding as the class progresses. In such an uncertain, 'messy and indeterminate' context, reflection-in-action is critical to addressing this and making sure that what happens next brings student learning back on track. This involves asking questions of ourselves and exploring the problem with the students to get to the bottom of it. Effective teaching, therefore, involves probing and questioning, reflecting on the outcomes of this process and adapting practice accordingly.

Kolb's (1984) experiential learning cycle was introduced in Chapter 1. Another influential model of reflection is Gibbs's reflective cycle (1988, p. 49). It builds on Kolb's work on experiential learning, and proposes that theory and practice enrich and inform each other in a never-ending cycle. Gibbs describes seven stages of a 'structured debriefing' in relation to the learning experience:

- Description – illustration of the teaching/learning experience, where no judgments are made and conclusions are not drawn.

- Feelings/reactions – describing the reactions and feelings that emerged as part of the experience.
- Evaluation – making value judgements about the experience.
- Analysis – making sense of the situation, bringing the ideas from outside the experience, comparison of different people's experience.
- Conclusions (general) – what can be concluded from the experience and the analysis undertaken.
- Conclusions (specific) – what can be concluded about one's own specific, unique and personal situation and way of thinking.
- Action plan – thinking about how to differently approach the same type of situation in the future; what steps can be taken on the basis of what was learned?

The model is a cycle: learning and actions provide new forms of experience that become the subject of reflection. Mezirow and Associates (2000) stress that professional learning happens because the teacher takes charge of his or her critical reflection and explicitly plans and carries out steps to learn from it, transforming his or her behaviour. This level of personal responsibility for learning is crucial during initial teacher education, but should continue throughout a professional career if the teacher is to be successful.

Dr Ron Ritchhart has an excellent bank of resources for teachers to develop themselves as reflective practitioners on his blog: www.ronritchhart.com/COT_Resources.html. He has also developed a tool for patterns of thinking in the classroom (available at tinyurl.com/patternsofthinkingtool), which helps structure a post hoc view of recent teaching and learning. A checklist called Visible Learning Inside (tinyurl.com/visiblelearninginside), developed by Professor John Hattie, provides an evaluation and reflection tool on teaching efficacy in the school. Here teachers are asked to reflect on what their students are telling them about the impact of their classroom practice. It is a powerful way of gaining feedback on teaching and learning in the school, as well as increasing student voice.

Table 8 illustrates how Cambridge Professional Development Qualifications are based around developing the teacher as a reflective practitioner.

Table 8: Developing reflective practice through Cambridge Professional Development Qualifications

Cambridge Professional Development Qualifications in teaching and learning	
<p>Cambridge Professional Development Qualifications contain a number of guiding questions to help develop teachers as reflective practitioners. These include:</p> <p>Module 1</p> <p>Unit 1:</p> <ul style="list-style-type: none"> • an identification and explanation of the key features teachers think make an effective lesson • an evaluation of the impact their new learning and experiences will have on their practice. <p>Unit 2:</p> <ul style="list-style-type: none"> • an analysis of the effectiveness of the lesson, highlighting what aspects went well and explaining why they think these went well • an evaluation of their existing teaching practice, identifying what aspects need further development and explaining how they intend to change and develop those aspects in their future practice. <p>Unit 3:</p> <ul style="list-style-type: none"> • an explanation of how they used formative assessment to monitor the learners' learning and progress and evaluate how effective it was • an evaluation of the new knowledge and skills they have developed throughout the programme and an explanation of how this will help to develop their future professional practice so that their learners will learn more effectively. <p>Module 2</p> <p>Based on the two taught sequential lessons and teacher experiences during this module, reflection will consider:</p> <ul style="list-style-type: none"> • an analysis of the approaches to teaching and learning they used in the two observed lessons – this should identify what engaged and motivated their learners to learn, and explain the reasons why • an evaluation of the two lessons, highlighting what worked well and why, and what did not work well and why – it should also explain what developments they intend to make in the future 	<p>Module 2 continued</p> <ul style="list-style-type: none"> • an evaluation of the learning activity and formative assessment activity they designed and used that were 'new' to their practice • an evaluation of their teaching practice and the learners' learning, using feedback from a variety of sources to identify existing strengths and those aspects that need further development. <p>Module 3</p> <p>Based on their Diploma experiences and teaching the sequence of learning (programme plan) designed for Module 2, reflection will consider:</p> <ul style="list-style-type: none"> • an evaluation of the current programme plan indicating what realistic and feasible changes they would like to make to develop future learning programmes • an analysis of the significant changes in their planning, teaching and assessment practice – this also explains why the changes have been adopted and the impact these have had on their learners' learning • an analysis of the strategies used to promote inclusive learning and the impact this had on the learners and their learning • an analysis of the activities that encouraged the learners to be curious and creative in their learning and how effective they were in motivating them to learn • an evaluation of how learning was inclusive so all the learners' learning was supported, challenged and extended • an analysis of how effectively formative assessments were used to support and monitor the learners' learning • a justification of why an understanding of the concept of learning and how people learn helps to develop their professional practice • an evaluation of the knowledge and skills they have developed during the Diploma programme – this should also explain what they intend to develop in their future professional practice to help their learners learn more effectively.

Reflective schools and school effectiveness

Schools need to be reflective organisations to set up the conditions needed for learners and teachers to be reflective. Effective schools are those that successfully progress the learning and growth of all of their students, regardless of background, beyond their normal expected developmental rate of growth. The two most important in-school variables to impact on student outcomes are the quality of teaching and school leadership.

Where should schools concentrate their efforts in terms of analysis and reflection? While there is no single key determinant of an effective school, research suggests that there are many things that schools can do to become more effective and maximise the chances of success for every child. These actions emerge from what are called the correlates (or indicators) of effective schools. These include: high academic standards and expectations; a school climate which focuses on achievement and learning; instructional leadership; high-performing teachers; students who are confident as learners and perceive themselves as in control of their learning; parents with high aspirations and expectations; resources that are fit for purpose; and excellent school governance including sound financial management.

Setting high standards for individual student achievement, measuring and tracking performance against these standards, and then intervening as soon as any student begins to fall behind these standards are central to effective schools. Schools that collect, analyse and reflect upon student achievement data, then design teaching strategies to build student outcomes, are likely to be effective (Barber & Mourshed, 2007).

The Cambridge Standards for School Self-Evaluation (see Table 9) are based on these indicators of effective schools and provide a mechanism by which schools can reflect upon them formally.

More detailed consideration of school effectiveness is provided in the *Developing your School with Cambridge guide*. This is available at: www.cambridgeinternational.org/teaching-and-learning/developing-your-school-with-cambridge/

Professional learning and development

A large body of research confirms that, of all the in-school variables that can be influenced, classroom teaching has the largest impact on student outcomes (Hallinger, Heck & Murphy, 2014; Hanushek & Rivkin, 2012; Hattie, 2009). It is what teachers know and do – their knowledge, pedagogical practices and relationships with students – that makes the difference in improving student learning outcomes. High-quality teachers are characterised by having a deep knowledge of their subject discipline and how concepts are taught, a commitment to ongoing professional development, high expectations for all students and the creation of a positive student–teacher relationship. According to Hattie (2003):

'Teachers account for about 30% of the variance [in student performance]... Students who are taught by expert teachers exhibit an understanding of the concepts targeted in instruction that is more integrated, more coherent, and at a higher level of abstraction than the understanding achieved by other students.'

Creating strong, professional learning communities among teachers is a powerful tool for improving student outcomes. Networks of professionals, planning and collaborating together around student learning, are known to have a greater collective impact than teachers working in isolation. The work of Bolam et al (2005) and Louis & Marks (1998) found that student achievement was significantly higher in schools with strong professional learning communities. It is important, therefore, that the focus shifts from helping individuals be more effective in their isolated classrooms to creating a collaborative culture of interdependence and shared responsibility (Dufour & Marzano, 2011; Fullan, Rincon-Gallardo & Hargreaves, 2015) and building, what Hattie (2015) calls 'collaborative expertise'.

School leadership and governance

The school principal, together with other senior administrators, has a critical role in creating the conditions necessary to support the learner attributes and the practices associated with effective schools. They need to provide a clear vision and sense of direction for the school, promote evidence-based teaching practices, prioritise professional learning, create a culture of high academic expectations and ensure that student learning is central to school improvement strategies. It is interesting to note that school leadership has a significant influence on student outcomes, second only to classroom teaching (see for example: Leithwood et al, 2004; Louis et al, 2010; Qian & Walker, 2011; Robinson, Lloyd & Rowe, 2008). Leadership is also the single most important determinant of attracting and retaining high-quality teachers (Darling-Hammond, 2013).

The importance of the principal as an instructional leader is well supported by research (see for example Robinson, 2008). Robinson concludes that the more school principals focus all their efforts and their own learning on improving teaching and learning, the greater their influence on student outcomes. More recently, Hattie (2015, p. 24) has argued that leaders need to build teacher instructional skills through 'collaborative expertise'. Fullan et al (2015) build on the theme of capacity building by arguing that the primary strategy for leaders is to build effective collaborative cultures.

Within the school the relationship between leadership and school improvement and school effectiveness is clear. What is also increasingly clear is the critical role that strong governance plays in effecting ongoing improvement. The Confederation of British Industry argues that 'evidence shows that more effective governance and higher quality leadership and management together have a positive effect on the quality of provision and on pupil achievement' (Confederation of British Industry, 2013 p. 8). Its research confirms that schools and principals need robust support structures to help drive improvements. Leaders benefit from a clear framework in which to act, so that they can carry out their roles effectively and be properly held to account.

The Cambridge Standards for School Self-Evaluation

The *Developing your School with Cambridge guide* Chapter 2 (available at www.cambridgeinternational.org/images/271307-creating-the-school-development-plan.pdf) considers the registration standards expected to become a Cambridge authorised school, and development planning post-registration. The Cambridge Standards for School Self-Evaluation (see Table 9 and Table 10) are designed to help schools reflect on their progress post-registration with Cambridge, providing more support for schools that want this service. Schools can complete a questionnaire that provides a carefully structured opportunity to engage with their three main stakeholders – students, staff and parents. It also allows them to collect data which will help them reflect on their performance, design improvement strategies and track progress over time in the key areas of performance as defined by the literature relating to effective schools.

The focus for school improvement defined in these standards is unambiguously a student learning culture and everything that contributes to that culture, such as leadership, teacher quality, governance and parental support and involvement.

While the evaluation surveys provide powerful feedback, schools are encouraged to collect other data sets (for example, academic results and annual improvement plans) to complement the data collected through these surveys. These data may also suggest that the school needs to investigate further particular areas for development, and this can be done at the school level through a range of analysis and data strategies.

Table 9: Cambridge Standards for School Self-Evaluation

Cambridge Standards for School Self-Evaluation	
<p>Domain 1 – The school's mission and values</p> <ol style="list-style-type: none"> 1. The school has a clear mission and vision statement underpinned by its educational values. 2. The culture of the school focuses strongly on student growth and the realisation of their potential in all areas of development. 3. The actions of the school leaders and teaching staff are consistent with the school's values and philosophy. 4. The school promotes intercultural understanding, celebrates diversity and actively develops in students a deep appreciation of other people's views and perspectives. 	<ol style="list-style-type: none"> 3. Teachers and teaching are of an excellent quality and are enhanced by systematic, high-quality professional development opportunities. 4. The teaching and learning programme caters effectively for individual student needs. 5. Formative assessment (assessment for learning) is embedded into classroom practice throughout the school. 6. Students at the school are actively engaged in their studies, think reflectively, and exhibit a love of learning. 7. Students demonstrate behaviours and attitudes that are consistent with the school's mission and values. 8. Student transitions from year to year are managed effectively and seamlessly.
<p>Domain 2 – School management and leadership</p> <ol style="list-style-type: none"> 1. The school principal and leadership team have the appropriate knowledge, skills and experience to lead the school effectively. 2. The school leadership team promotes high-quality educational programmes and activities for all students and tracks individual growth. 3. The school culture is inclusive and supports all students and staff in their learning and development. 4. All members of staff are supported through a performance and development programme which focuses on continuous improvement. 5. The leadership team has a clear process for evaluating programmes and developing school-wide improvement strategies. 6. Teachers and staff have a clear sense of their shared purpose and mission. 7. Students and staff feel valued and are treated with dignity and sensitivity. 	<p>Domain 4 – The physical environment of the school</p> <ol style="list-style-type: none"> 1. The school's resources are sufficient to support a high-quality teaching and learning programme. 2. The school is a safe and secure place in which students can learn. 3. Students have access to up-to-date technology, tools and resources to enable quality learning. 4. The school uses resources sustainably and in turn encourages students to take responsibility for the local and wider environment in which they live.
<p>Domain 3 – Quality of teaching and learning</p> <ol style="list-style-type: none"> 1. The school's written curriculum is fully articulated and made available to the school community. 2. The school is committed to an ongoing and rigorous review of its academic programme to ensure quality outcomes for all. 	<p>Domain 5 – School community engagement</p> <ol style="list-style-type: none"> 1. School parents are actively engaged in the life of the school and have regular opportunities to contribute their knowledge and expertise. 2. Parents receive regular reports about the progress of their child/ren in academic domains as well as other areas of development. 3. Parents are perceived as co-partners in their child/ren's learning. 4. The school engages with and mobilises relevant individuals and groups within the community and welcomes them as co-contributors to the life of the school.

Table 10: Some exemplar questions from the Cambridge Standards for School Self-Evaluation

Examples of questions asked against Cambridge Standards for School Self-Evaluation:

Formative assessment (assessment for learning) is embedded into classroom practice throughout the school. (Standard 5)

To what extent do students agree with the following?

- My teachers provide me with feedback about my learning on a regular basis.
- My teachers help me to understand mistakes I have made.
- My teachers regularly mark my work and return it to me promptly.
- My teachers provide support when I am having difficulties.
- I am encouraged to give feedback to teachers on my learning.
- In my assignments, I know what I have to do to be successful.

To what extent do teachers agree with the following?

- In my classes, I use a broad range of assessment tasks.
- Students have opportunities to provide written feedback about their learning in their classes.
- Students have opportunities to improve their work after they receive feedback.
- It is important to show students what success looks like in their learning.
- I always give students written feedback about their work.
- I use a range of formative assessment strategies to plan the next steps in my students' learning.
- I know what the key concepts are for my curriculum area and pay particular attention to them in my classroom practice.

To what extent do parents and carers agree with the following?

- Teachers provide feedback through written comments on assignments.
- Our children receive individual attention with any difficulties they may encounter.
- Our children know where they are in their learning and what they have to do next to improve.

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Resources

A number of resources are available in the Cambridge 'Teaching and learning' area of the Cambridge International website at www.cambridgeinternational.org/learning:

- Getting Started with Reflective Practice
- Getting Started with Metacognition
- Education Brief on metacognition
- Active Learning

Building Learning Power presentation by Professor Guy Claxton at the Cambridge Schools Conference, Homerton College, 2014. Guy Claxton is a widely respected and experienced neuro-scientist, author and educationalist with a particular passion for developing students' capacity for life-long learning:

Podcast: <https://soundcloud.com/cie-education/the-building-learning-power-approach-to-making-successful-independent-lifelong-learners>

Presentation slides: <http://www.cambridgeinternational.org/images/177923-guy-claxton.pdf>

Guy Claxton's website with resources: <https://www.buildinglearningpower.com>

Chris Watkins' website contains a very large number of excellent, free resources: chriswatkins.net

Harvard University Project Zero: A number of resources for teachers to develop themselves as reflective practitioners can be found on Dr Ron Ritchhart's blog: http://www.ronritchhart.com/COT_Resources.html. As a researcher at Harvard Graduate School of Education's Project Zero, Ritchhart has developed a patterns of thinking in the classroom reflection tool, which helps structure a post hoc view of recent teaching and learning: tinyurl.com/patternsofthinkingtool

See also Harvard University Visible Thinking:

http://www.visiblethinkingpz.org/VisibleThinking_html_files/03_ThinkingRoutines/03d_UnderstandingRoutines/ConnectExtendChallenge/ConnectExtend_Routine.html [Accessed 10 April 2017].

Stanford University's Teaching Commons website:

<https://teachingcommons.stanford.edu/teaching-talk/exam-wrappers>

John Hattie: Visible Learning Inside: A checklist, developed by Professor John Hattie of Melbourne University. **Visible Learning Inside** is an evaluation and reflection tool, completed by students, on teaching efficacy in the school. Here teachers are asked to reflect on what their students are telling them about the impact of their classroom practice. It is a powerful way of gaining feedback on teaching and learning in the school, as well as increasing student voice. **The Education Endowment Fund (Sutton Trust) toolkit:**

<https://educationendowmentfoundation.org.uk/resources/teaching-learning-toolkit/meta-cognition-and-self-regulation>

Listen to **Prof Dylan Wiliam** talk about the importance of young people being able to reflect on their learning and how teachers can utilise these insights:

<https://www.youtube.com/watch?v=bojaoVYrBmE>