CHAPTER 1

Independent learning: what is it and why is it important?

‘Give a man a fish and you feed him for a day, teach him how to fish and you feed him for a lifetime’.

(Chinese proverb)

Introduction

With an emphasis on the learner being central to any learning process, this introductory chapter sets the tone for the book. It is essential that you and your pupils (in the role of learners) are central to this book. So I begin by drawing attention to your learning; what you consider it is and how you perceive the learning process. I go on to challenge you to reflect on the process you undertake when learning something new. I then explore different types of learning, thinking about the disparity between ‘shallow’ and ‘deep’ learning. With this in mind I introduce the idea of ‘independent learning’ and explore its various perspectives and the different views people hold about this term. Through a series of activities and examples, I suggest how autonomous, creative and critically reflective learning can be introduced and developed. Future chapters in the book pick up the reins of development presenting ideas, strategies and suggestions, while emphasizing the unique role middle-phase education (7–12-year-olds) has to play in the process.

As you progress through this chapter bear in mind how you learn and consider why you do things in the way you do: what influences affect you as a learner and the learning process you undertake? What are the likely implications and impact of the subsequent actions you perform and do they enhance or hinder the learning process overall?
What is learning and how do we do it?

Activity 1.1 Thinking about learning (I)
Consider for a moment what you understand by the verb ‘to learn’. How do you know when you have learnt something and how does that learning take place? To externalize your thoughts, jot them down in a notebook or share them with a colleague.

The word ‘learn’ comes from the old English term *lore*, as in *farming lore*, which literally means ‘instruction’ and refers to a body of traditions and knowledge on a subject, in this case farming. Perceiving the term in this way reinforces the idea of ‘imparting information’ to a previously information-less being. We know from Ausubel (1968) and others that learners of all ages and types are not blank canvases on which to impart information. They can be influenced, yes, but every learner brings with them to the learning situation their unique perception of the world from their previous experiences. We forget this at our peril! This important issue is revisited in Chapter 2.

From a theoretical educator’s point of view Kyriacou (2001) describes learning as a person’s changes in behaviour that takes place as a result of being engaged in an educational experience. This suggests the capacity to do something different from what could be done before. How does this equate with your own perception of ‘learning’?

Activity 1.2 Thinking about learning (II)
Now consider how you learn something new. Begin with something that naturally interests you; for example, a new language for your
As we reflect on our learning we realize that we approach learning in different ways. The approach used, the motivators and the amount of time we dedicate to the process may vary considerably. An example of this comes from some undergraduate students discussing motivation and learning. Having initially discussed why and how they learn, they debate some of the issues they encounter and the demotivation they sometimes experience, especially when learning certain topics. As the dialogue develops they stumble over an example of learning for learning’s sake; in this quote the student is referring to learning to play the guitar, purely for pleasure . . . ‘You decide to learn it and you learn it. You know, it’s not because someone says you’ve got to learn guitar.’ This was immensely rewarding to hear, especially considering the beginning of the diatribe went something like this:

\[ \ldots \text{You know, I’ve learnt because I need to learn for assignments . . .} \]
\[ \text{I’ve quite enjoyed it sometimes, but I can’t think when I’ve ever been to the library and thought, ooh, I want to learn about such and such today, I’m going to get a book out and learn about it.} \]

\( (\text{BSc QTS Year 2 student, 2009}) \)

Think about how this relates to you: I can certainly find plenty of displacement activities to do instead of focusing on the work I know I should be doing. The outcomes arising from such a situation where we learn something because we have to is that the information has little meaning or ‘depth’, and may be easily forgotten.

**Activity 1.3 Thinking about ‘shallow’ learning**

The last time you sat an exam or took a test, for example, your driving test, how much of the detail you imparted during the test can you recall now?

How much do you think you could recall immediately after the exam?
Often the reply to this is ‘... not very much!’ This is because the information was only committed to the short-term memory, never being fully embedded in the longer term.

This is an example of ‘shallow’ learning and is typified by cramming for an exam.

For the learning process to be productive the learner must first take ownership of the ideas. Until this happens the learner’s engagement remains superficial, and ‘deep learning’, the type that is sustained, which can be applied to new situations and further developed, remains beyond their grasp. To achieve this demands an inner drive or motivation that arises from the learner themselves. The information must have relevance and be accessible to the learner, but more importantly the learner must want to learn it. It is this final prerequisite that is so fundamental to any learning process: without that motivation, without that innermost drive, learning becomes a mundane, meaningless operation fit only for an objective-driven assessment process.

Consider the following activity:

**Activity 1.4 Non-contextualized teaching**

Using the information provided, calculate the distance between A and D using the following routes and decide which is the shortest route, calling at all points and why.

A to B = 5 km  
B to C = 3 km  
B to D = 6 km  
C to D = 10 km

Alternative routes:

1. A to B to C to D  
   5 + 3 + 10 = 18 km

2. A to B to C to B to D  
   5 + 3 + 3 + 6 = 17 km

Answer = Route 2 because it is shorter by 1 km
‘...but I *wanted* to pass my driving test’ I hear you exclaim! And I wanted to pass my French CSE which I got such an abysmal grade for considering I was taught it and tried to learn it for nine years. So where did it all go wrong? This I believe is where our approach to primary education and its underpinning research and developmental strategies play such a unique and significant role.

Now consider the same problem but set in a familiar context.

**Activity 1.5 Contextualized teaching**

It was Christmas Eve and Father Christmas had three final stops to make before he could give the reindeers a break at a special hideaway lodge in the forest. He was rather concerned because Dasher, one of his most reliable reindeers, had knocked his hind leg and really needed that rest. Father Christmas had three more houses to visit on the way but he must decide which would be the shortest route to take to get him to the lodge as quickly as possible. Using the information below, can you help Father Christmas decide which route would be the shortest and by how much?

- Jonny Granger’s house to The Old House on the Hill is 5 km
- The Old House on the Hill to Little Sally Mathis’ house is 3 km
- The Old House on the Hill straight to the Lodge is 6 km and,
- Little Sally Mathis’ house to the Lodge is 10 km.

The calculation is exactly the same as the example in Activity 1.4. By placing the problem in a recognizable context it gives meaning to the seemingly inexplicable; that is, why C (Little Sally Mathis’ house) should be included in the calculation. It also, of course, makes the exercise more interesting. One argument against this approach is that it could make the whole thing more complicated; this of course would be more challenging and could be made more accessible by drawing a map and including pictures to illustrate the information!

The same argument of course applies to primary science, having no obvious relevance other than the concept or idea we are trying to demonstrate at the time. Instead we set the scene for our investigation aiming to capture the pupils’ imagination and hopefully drawing them into the
Developing Independent Learning in Science

challenge of the investigation by giving them ownership over the exercise. This way the learner indeed becomes central to the learning process, but is this what we mean by independent learning?

Independent learning: what exactly is it?

To answer this question we must first examine what went wrong in the above situation concerning my learning of French. I suspect the problem with the way I tried to learn French some 30 years ago and why I can only remember snippets, such as counting to 10 and survival phrases such as ‘Parlez vous Anglais?’, was to do with the way it was taught. In those days language tuition was not set in a cultural context; there was little inspiration attached to it despite attempts to set the exercises within a familiar context and the innovative use of a ‘language lab’ using technology that emphasized individual learning through audio input and repetition. Owing to the nature of the technology it was possible for the teacher to listen to us individually. The idea was ground-breaking at the time but for me the lessons lacked the opportunity to develop any real understanding of the language. I was essentially cramming for an exam, learning the content to pass a specific test, and forgetting the majority of it as soon as I walked out of the exam hall; a classic example of shallow learning. The end product, any ‘knowledge’ I did retain, was disconnected from reality, only useful in very specific situations; it lacked depth and real understanding on my part. Biggs and Tang (2009) describe this type of learning as characterized by an intention only to complete the task requirements, usually by memorizing information for assessment purposes while often associating facts and concepts unreflectively. Significant emphasis, as we have seen, is placed on external or extrinsic drivers, such as passing the examination.

From a pedagogic standing this type of learning and the modes of teaching that promote it have been demonstrated to lead in the long term to pupils’ reduced confidence, demotivation and subsequent strategic, assessment-oriented approach to learning (Lakin, 2010). Deep learning, on the other hand, is characterized by an intention to ‘understand’ and has an internal, intrinsic motivational emphasis. It requires the acquisition of specific higher-order problem-solving skills, such as those of analysis, interpretation and evaluating: we return to the acquisition of these specific skills in Chapter 3, 4 and 5.

The idea that deep learning is internally motivated suggests a degree of ownership on the part of the learner. As teachers we recognize this as being
Independent learning is an important factor in encouraging engagement. However, the use of the term ‘ownership’ does have its limitations: one can be given or assume ownership of something but not do anything about it. The process has to be active and the learner must assume some responsibility for it. Think again about learning a language. It is not just to do with knowing the words, how they are pronounced properly or fit together in a coherent manner. To speak a foreign language you need to know how the language ‘works’, which relates to culture and emotion. To develop a real understanding of the ‘fabric’ of a language takes time, engagement, practice and commitment, all of which demand learner motivation and drive. So where does the teacher feature in all this? We provide the context and opportunities for this type of learning to develop, thereby enabling the learner to assume increasing responsibility for the learning process. For Pritchard (2005) this is what independent learning is all about: learners being given and accepting increasing amounts of responsibility for their own learning.

With this in mind, think about Activity 1.6 that invites you to examine your own perception of independent learning.

**Activity 1.6  Examining your own perception of independent learning**

First, think about yourself as a learner.

- How do you learn best?
- What do you do and what factors influence your learning process?
  
  You need to clarify this concept before moving on.

Now in relation to your class and you as a teacher, answer the following questions:

- How do you perceive the term *independent learning*?
- Compare your view with that of several colleagues.
  - What similarities do they show and what differences?
  - What factors do you think influenced or determined the various answers?
- Do you consider yourself to be an independent learner?
  - Justify your answer whatever it may be.
When a group of teachers of 7–12-year-olds were asked these questions, they presented some interesting similarities in their responses, yet also some very significant differences. For example the term ‘ownership’ featured in at least a third of the answers although only a third of these mentioned the more active approach of taking responsibility for their learning. Several mentioned that independent learners displayed the higher-level skills of reflection, analysis and evaluation. Others mentioned that such people were able to improve their learning through the use of constructive feedback and at times were capable of self-correction. The majority of the responses referred to working by oneself, without any instruction or teacher input. Again this varied in complexity; some referred merely to working alone, while others recognized that the learner was driving their own learning, making decisions and seeking out information with minimal guidance and support. Some responses commented on the benefits afforded by peers and other people involved in supporting the independent learner; they were essentially talking about the credentials of a learning community. A summary of these responses and the spectrum across which they spanned is included in Table 1.1.

**Teachers’ perception of the term ‘independent learning’**

These responses go some way towards an accepted definition for ‘independent learning’ that has developed over several years of research and pedagogic application:

> the ability [of the learner] to assess their own knowledge and understanding in the light of information received, and if necessary, self-correct and direct progression in relation to their reflectively perceived needs. To achieve this, the learner must be autonomous and creative in their thinking and constructively critical of their understanding.

(Lakin, 2010:7)

So what does this mean, how does it relate to you as a teacher of pupils between the years of 7 and 12, and why is it so important? The responses summarized in Table 1.1 collectively provide a good explanation of what independent learning is all about. Clearly it goes beyond working in physical isolation. In fact it has been stated that perhaps a better term would be ‘interdependent learning’ (Lakin, 2010) because this type of learning so often involves influence, discussion and debate from others including parents, grandparents, teachers, peers and so on. Independent learning has rather candidly been described as the ‘Martini approach’ to
<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Spectrum of examples</th>
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<tbody>
<tr>
<td></td>
<td>Assuming ownership – passive</td>
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<tr>
<td></td>
<td>Assuming responsibility – Guided and facilitated by HoS</td>
</tr>
<tr>
<td></td>
<td>Demonstrating autonomy</td>
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<td></td>
<td>Demonstrating reflective and analytical practice</td>
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<tr>
<td>Approaches to learning</td>
<td></td>
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<tr>
<td>Able to improve a task – can act on feedback</td>
<td>Able to follow instruction</td>
</tr>
<tr>
<td>Make own choices e.g. equipment, resources, etc.</td>
<td>Self-assessing</td>
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<tr>
<td>Finding information for themselves/ knowing how to find out more</td>
<td>Know where to look</td>
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<tr>
<td></td>
<td>Know how to find information</td>
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<tr>
<td></td>
<td>Aware of how to learn leading to deeper knowledge and understanding.</td>
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<tr>
<td></td>
<td>Able to self-correct and improve their performance</td>
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<tr>
<td></td>
<td>Autonomously</td>
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<td></td>
<td>Able to assess effectiveness of research process</td>
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*(continued overleaf)*
<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Spectrum of examples</th>
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<tbody>
<tr>
<td>Directed/managed by learner</td>
<td>Work with some direction</td>
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<tr>
<td>Partly or solely</td>
<td>Teacher directed – able to be flexible with timing</td>
</tr>
<tr>
<td>Allow to work at own pace but teacher-directed</td>
<td>Input from teacher and pupils</td>
</tr>
<tr>
<td>Actively learning</td>
<td>Work on own but with some direction</td>
</tr>
<tr>
<td>Learning community</td>
<td>Work within a pre-established working group</td>
</tr>
<tr>
<td>Works on own without help or structured direction</td>
<td>Work within a pre-established working group</td>
</tr>
<tr>
<td></td>
<td>Direct their own learning</td>
</tr>
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<td></td>
<td>Manage and direct their own learning</td>
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</table>
learning: anytime, anyplace, anywhere, with anyone! This is because ‘independent learning’ is a process that the learner goes through themselves – it isn’t something that can be done to them; they can be influenced, guided and supported by others but this in-depth learning they have to do themselves. They are the one making the decisions, directing and managing the process, reflecting on progress, seeking out new information and applying it where necessary. During this procedure they are constructing meaning and developing understanding – they are independent learners.

If this is the case and the independent learner is truly autonomous, then what is our role as teachers? First we must remember that becoming an independent learner is something that develops over time; we must, therefore, consider the full education spectrum and recognize that this age range (7–12) is one part of the whole spectrum. Second, as professional practitioners we aim to guide, scaffold, facilitate and enable learning by providing suitably differentiated learning opportunities for our pupils. These are all qualities that go towards promoting independent learning. So you are probably doing it anyway ... consider Activity 1.7.

Activity 1.7 Examining your own practice

Think about your class and answer the following questions:

- What opportunities have you given your pupils over the past week that allows them to take responsibility for their learning?
- How did they respond? Identify a pupil who you feel is or aspires to being an independent learner and one pupil who you feel finds this more challenging.
- List the evidence you have to support your decision.

It is often helpful to compare and discuss your answers with a colleague, especially someone you feel comfortable talking to and who knows your pupils. Try this and see what their thoughts are.
Some suggestions put forward by other teachers are listed in Table 1.2. They are expounded later in Chapters 3, 4 and 5.

You will probably recognize several of these examples already in your teaching. You will also recognize that not all pupils aspire to them and indeed we should not expect them to. This is where your role features significantly. The two important features here concern differentiation in terms of scope and the quality of guidance:

- **Scope** – refers to what the pupils are being asked to do, the detail, the depth of understanding, the amount of complexity, the use and evaluation of different approaches, the amount of uncertainty.

- **Guidance** – how much information and structure pupils will be given and how much they are expected to do using their own initiative.

### Table 1.2  Some teachers’ responses to examining and promoting independent learning opportunities and where they are addressed in Chapters 3, 4 and 5

<table>
<thead>
<tr>
<th>Developing self-esteem</th>
<th>Chapter 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>● Enabling pupils to take responsibility for a particular task in class</td>
<td></td>
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<tr>
<td>○ i.e. book monitor</td>
<td></td>
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<tr>
<td>● Communicating information</td>
<td></td>
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<tr>
<td>○ pupils plan and give presentations</td>
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<tr>
<td>● Encouraging flexibility in their approach to things</td>
<td></td>
</tr>
<tr>
<td>Practising a new skill or newly acquired information and applying it in a new context</td>
<td>Chapter 3</td>
</tr>
<tr>
<td>Making use of context and real-life situations</td>
<td></td>
</tr>
<tr>
<td>Focusing on the learning process rather than just the products of learning</td>
<td>Chapters 3 and 4</td>
</tr>
<tr>
<td>Connecting new information with previously acquired information</td>
<td>Chapter 4</td>
</tr>
<tr>
<td>Encouraging pupils to self-monitor and record achievements</td>
<td>Chapters 3 and 4</td>
</tr>
<tr>
<td>Helping, setting and solving each other’s problems</td>
<td>Chapter 5</td>
</tr>
<tr>
<td>Making reviewing and reflecting on learning a regular feature in lessons</td>
<td>Chapters 4 and 5</td>
</tr>
</tbody>
</table>
It is these features that underpin learning development and progression. If we consider the latter certain stages come to mind; have a go at the example in Activity 1.8:

<table>
<thead>
<tr>
<th>Activity 1.8 Exploring developmental progression</th>
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<tr>
<td>Complete the following table that summarizes developmental progression from the learner’s perspective. The first one is done for you.</td>
</tr>
<tr>
<td>Teacher dependent</td>
</tr>
<tr>
<td>Simple</td>
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<tr>
<td>Use everyday language</td>
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</tbody>
</table>

Suggested answers are available at the end of this chapter.

The activity above outlines extremes on different spectra of progression. From a teaching point of view we must be able to differentiate across the progression spectrum. To achieve this we need to consider the varying levels of scope and guidance available to the teacher. For example, we often prompt pupils to explain their descriptive accounts by including the word ‘because’ on a worksheet or by asking them ‘why they think such-and-such has occurred’. This will reveal levels of understanding that serve as useful formative feedback. When considering progression from concrete to abstract scientific ideas the situation becomes more challenging. For example, consider the sequence of events undertaken to introduce ‘forces’ to pupils during their primary years. We usually begin by exploring pushes and pulls, something the pupils experience and interact with on a day-to-day basis. Later we move on to the abstract idea of gravity, often relating it to the concept of density. Think about the progressive steps we outline in teaching density (see Figure 1.1).

This is an example of progression in terms of the scope of a concept to be learnt: the depth of understanding and the degree of complexity for example that the pupil is expected to take on board. The amount of guidance and support they are given and indeed require is dependent on several factors. We return to this idea of progression, scope and guidance in Chapter 4. Too often as teachers we are accused of ‘spoon-feeding’ our pupils, but there are several reasons for doing this:
● It could be that we consider it the only way to ensure that our pupils receive the information they need for assessment purposes (the product view of education),
  ○ and for that reason we are often afraid to surrender control of their learning to the pupils.
● It could be that the pupils themselves demand to know the answers (‘don’t teach me, just tell me what I need to know!’)
  ○ I have often experienced this with older students.
● It could be that owing to time constraints we have a great deal to get through in such a limited amount of time that ‘... quite frankly there’s no time for this “woolly” approach to education. So just give the pupils the information and move on!’

Figure 1.1 Progression within the concept: density

Density pyramid showing how abstract scientific ideas can be built up progressively through accumulated experience

Source: Littledyke et al. (2003)
These are reasons that evoke a variety of responses, but consider how much the pupils are really taking away with them in terms of learning and value added from each of these scenarios. Unless pupils go beyond gaining the required information, to actually being able to do something meaningful with it, they will not progress. Their learning will be shallow and superficial without any depth of understanding or retention. So in our teaching, differentiation in terms of scope and guidance is fundamental to the learning process and the development of independent learners. It forms the cornerstone of effective progression and ultimately, successful transition. We revisit this in greater depth over the next few chapters.

**So why is it important to develop our pupils as independent learners?**

If the above paragraph is true, giving increasing responsibility for learning to the pupil together with the subsequent challenges that accompany this is time-consuming, challenging and potentially risky in attainment terms. Why then are we encouraged to develop pupils who are independent learners? Have a go at the next Activity (1.9):

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**Activity 1.9 Potential benefits of being an independent learner**

- What, from a pupil’s perspective, do you consider to be the benefits of being an independent learner (within the definition stated above)?
- What benefits will it bestow on you as a teacher?
- What do you consider are the potential disadvantages of becoming an independent learner?

Once again, share your answers with a colleague.

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Over the years there has been considerable educational research conducted into how pupils learn in science education and the implications of an essentially didactic, assessment-led curriculum, whereby pupils may be active physically but are not necessarily active and engaged cognitively. Developing the skills and competences of independent learning has
frequently been presented as a solution to this ever prevalent situation (Millar, 1989; Osborne and Dillon, 2008; Lakin, 2010). Some of the reasons put forward include:

- Placing increasing responsibility for learning on the learner themselves acts as a motivational driver for learning: the pupil is more likely to want to learn if they are directly involved in the nature, content and design of the learning process. There are of course limitations to this, take for example the opening quote for this chapter, what if the man doesn’t want to fish or doesn’t like fish? These are but additional barriers to the process but not insurmountable; there are ways around them as we will see in Chapters 3, 4, 5 and especially Chapter 6.

- The learner becomes increasingly in control of their decisions and hence their learning. This can be an enormous benefit because with help and guidance they can set a pace and level of development that is right for them. This is a challenging idea that requires cognitive engagement if it is to be successful (not just a case of taking the easiest option); as we see in Chapter 3, it is something that pupils are already encouraged do to varying degrees.

- The impact in terms of learning is the greatest benefit: research evidence suggests that pupils will develop understanding and with appropriate help and guidance will create meaning and retain what they have learnt (Lakin, 2004; Osborne and Dillon, 2008; Ross et al., 2010). The following analogy in Activity 1.10 explains this perspective:

**Activity 1.10 Cycling analogy**

*Image by G. Burch, 2012*

Compare that last bullet point with the analogy of a child learning to ride a bike. By distilling the process the following steps emerge:

- Begin with the use of stabilizers and a helping hand
- Then being able to ride with just one stabilizer and then none at all
Finally, one of the most significant potential benefits of independent learning is that there is invariably some element of self-satisfaction with it. With the learner being in the driving seat there is a greater chance that the activity whatever it may be will interest, motivate and hopefully inspire, whilst bringing about some element of pleasure as well!

Unpicking

Take a few minutes to look back over the activities featured in this chapter; think about the approach taken with each. First you were asked to carry out a specific task but in nearly every case you were invited to externalize your answer by either writing it down or verbalizing it to someone else. By doing so you were rehearsing and confirming your thoughts. The ideal scenario is to discuss them: first articulating your thoughts in such a way that the other person can understand them, then you need to listen to their view on the situation (it helps if they have some experience of the topic). It may not always be possible to discuss your thoughts, but externalizing visually still has its benefits. Representing your thoughts as a concept map or flow diagram requires you to use the higher-level skills of analysis and synthesis. These opportunities when presented to pupils can be immensely beneficial and go some way to developing those skills of independent thought and learning we are seeking to augment. This is an example of ‘reformulation’: a process by which the learner revisits and restates their interpretation of the information in question. It is an invaluable aspect of the learning process and one to be encouraged. Think carefully about the form you wish this process to take; it may not be appropriate to use words as this could distract...
from the emphasis of the task because, for example, the pupil may have
difficulty with writing or with the use of English. Perhaps suggest a variety
of alternative vehicles such as drawings, photographs and sound recordings
as a means of capturing and communicating ideas.

Summary

During this chapter we developed a definition for ‘independent learning’,
one which began by exploring ownership and taking responsibility for one’s
learning but went on to emphasize the importance of autonomy, creativity
and critical thinking. To achieve this level of independence requires differ-
etiation in terms of both the scope of the learning and the amount and
type of guidance afforded by the teacher. The focus was directed towards
the learner being central to the learning process and the content being rele-
vant, useful and retained; hence the quote heading the chapter.

The benefits of becoming an independent learner were explored initially
in terms of motivation and personal drive, then later with regard to long-
term impact and knowledge retention as the learner begins to create
meaning and develop understanding. The idea of reformulation: external-
izing, applying and synthesizing newly acquired knowledge and under-
standing was introduced through the various activities supporting this
chapter. This important and fundamental aspect of learning takes the
process further and to be fully effective demands interaction and exchange
with others. Interdependent learning features significantly in the second
half of the book but before then in Chapter 2 we delve deeper into our
perception of knowledge, science and education. We go on to analyse the
many factors influencing our teaching and the pupils’ learning.

<table>
<thead>
<tr>
<th>Table 1.3 Progression in teaching and learning</th>
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<tr>
<td>Teacher dependent</td>
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Cycling analogy

This analogy illustrates admirably the development of a skill that once established can generally be picked up again many years later providing the cyclist is physically able and has a bike. You may wobble a bit at first but it will not take long for the skill to resurface. So how similar is this to independent learning? There are several similarities:

- Riding a bike is a skill that will improve and can be perfected with practice.
- Although ‘cycling’ generally involves just you and the bike, riding, like the outcome of being an independent learner, can involve and influence others as well as yourself. It is here that the analogy begins to break down: cycling with others may enhance the pleasure of riding and possibly perfect the skill, but it is not a necessary requirement of developing the skill of being able to ride. With independent learning on the other hand, interaction and cognitive exchange with others is a fundamental aspect of developing the skills associated with cognitive autonomy and personal reflectiveness; a perspective we explore in the later chapters of this book.