

TWO

Learning & critical thinking: the essentials

WHY YOU NEED TO KNOW THIS

- What makes a high-quality essay or report? You need to know this to help you to be successful – to produce a piece of work that will gain a really good mark. It is therefore vital to develop your own clear awareness of the criteria of academic quality which will be applied by those who assess your work.
- This knowledge will not only enable you to perform effectively in terms of gaining good marks and leaving university with a good degree. It will also help you develop longer-term goals which are of great importance in higher education – to develop the independent evidence-based learning and problem-solving skills you will need to equip you to be effective in your working and personal life in modern society.
- However, before we can come to grips with the central question of what constitutes quality in academic work, we need to understand the basics of learning and assessment. In order to build advanced knowledge we need firm foundations.
- These foundations include knowing exactly what is meant by terms such as ‘learning’, ‘evidence’ and ‘critical thinking’ and how these will be judged and assessed. This chapter establishes clear working definitions of basic concepts and processes, so that we can progress to explore more advanced issues on a solid basis of shared understanding.

Learning and assessment basics

When you are enrolled on a taught course at university, you are assigned various coursework tasks (e.g. to write an essay or research a project). You are provided with appropriate teaching, advice and supervision, and have to produce end products (a finished essay or dissertation). These are assessed and the marks you receive form the basis for determining your performance, and ultimately your success in being awarded an appropriate qualification. Information informs all of this process (Figure 2.1).

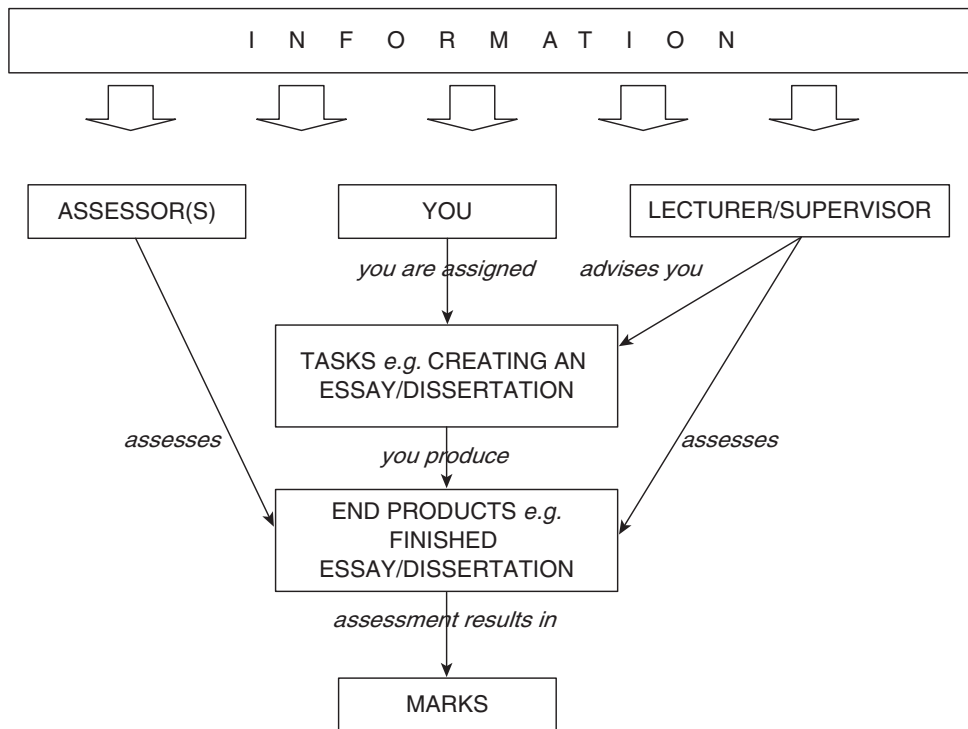


Figure 2.1 The basic academic process

Note that your work may be assessed by more than one person, whom I have termed ‘assessor(s)’ and ‘lecturer/supervisor’ in Figure 2.1. Often, your work will be marked by the lecturer who set your essay or who will be supervising your research. Sometimes a second marker may also mark your work – for example in the case of Master’s dissertations. At research degree level, an independent external examiner from another university will assess your work. You should also bear in mind that all academic degree programmes have an independent external examiner, whose role is to monitor and maintain academic standards.

Have a look at the box below. Don’t continue until you’ve spent some time over this. It is important to think deeply about these basic concepts.

THINK

If you had to mark an essay, project report or dissertation, what are the essential things you would look for to give it a ‘pass’?

I would look for evidence of...



Did your answer include any or all of the following terms?

Understanding...

Learning...

Knowledge...

You are certainly expected to show evidence of one or more of these at a basic level. If your essay or report does *not* provide such evidence, then you should not expect to receive a 'pass' mark.

This may seem perfectly obvious, but we need to delve a little deeper. *Knowledge*, *learning* and *understanding* seem very desirable, but what *exactly* are they? We use these words all the time, but are rarely called upon to define them unequivocally – and in a way that clearly differentiates each from the others.

THINK

Write below exactly what you understand by these words.

Knowledge can be defined as...

Understanding can be defined as...

Learning can be defined as ...

Again, don't continue until you've had a really good think about this.

Bear in mind that there is no uniformly agreed way of defining these terms. They can be defined in different ways at differing levels of complexity. Here are the working definitions used in this book...



Knowledge is defined here as *what is considered to be true, or certain* (as opposed, for example, to unsubstantiated beliefs). You can know: *that something is so* (declarative knowledge); *how something is or can be done* (procedural knowledge); and *why something is so* (schematic knowledge).

Understanding something is *having knowledge about it*.

Learning is *the process of acquiring knowledge (coming to understand something)*.

Knowing about something enables you to make claims about it. But you can know things with *varying levels of certainty*. This means that you can claim that something *is* so – or you can claim that something *may be* so. In this book I use the term ‘assertion’ to indicate a claim that something *is* so, and the term ‘proposition’ to indicate a claim that something *may be* so.

But assessment at higher education level generally entails more than looking for evidence of basic understanding, knowledge or learning. We can discover what else is required if we examine the sort of assessment criteria typically used by lecturers when they mark essays and research projects.

Over and above basic understanding, such criteria require evidence of additional qualities. The following are criteria commonly used to assess students’ essays:

Interpretation and scope

Understanding of topic

Use of authoritative literature

Critical analysis

Evaluation of evidence

Synthesis of ideas

Structure and logical development

Here we have some important concepts which go beyond simple *understanding*. Some seem very straightforward – for example, *scope* and *logical structure*. It seems fairly obvious that you should make sure your essay or report is appropriately scoped – that is, it focuses on what you have been asked to focus on. It would also seem self-evident that your work should display a structure that is logical. You would hardly want it to be *illogical*.

But these criteria also include *interpretation*, *critical analysis*, *evaluation of evidence*, *synthesis of ideas* and *authoritative literature*. What exactly do these refer to? They imply that you have to do *more* in an essay or report than simply understand and then describe what you have been told by experts, in lectures and books.



Analysis entails actively breaking something down into its component parts. *Synthesis* entails actively bringing things together to form a whole. *Evaluation* also implies that you have to do more than just understand the information you find or are given. You also need to assess its merits – its strengths, its weaknesses, and its appropriateness for your purposes. And *interpretation* implies that there isn't necessarily just one way of reading something. *Authoritative* literature also implies that there must also be *non-authoritative* literature. ('Literature' in the academic world means more than just literary works like novels – it refers to the complete range of academic writings in an area of study, including books, journal articles, theses, etc., in which ideas are put forward.)

In a nutshell, what is implied by the latter three concepts is the existence of *alternatives* – alternative ideas, alternative interpretations and alternative information sources. Also implied is the fact that you need to be able to assess their relative merits – and to choose and reject them as appropriate. This is the essence of *critical thinking*.

THINK

But if you are at university, then surely what you are paying for is to be provided with up-to-date, accurate information in your chosen subject of study?

If knowledge is 'what is considered to be true', isn't this precisely what you expect to be provided to you by your lecturers? Surely the information they give you should already have been thoroughly analysed, synthesised and evaluated by them – the experts?

What's your view on this? Take a few moments to think about it before you continue.

We defined *knowledge* as *what is considered to be true, or certain*. However, what *you* consider as true or certain may not necessarily be considered by someone else as true or certain. There is, therefore, a sense in which we can say that *your* knowledge may be different from *another person's* knowledge.

To complicate matters, we also often use the word 'knowledge' in a less subjective sense to indicate *not* what a particular person considers as certain, but rather what is *more generally* agreed to be certain within a particular community – or in society more generally. From this less subjective perspective, even though *you* may be completely convinced by the evidence available to you that a particular belief is justified (and thereby becomes part of your own knowledge), it does not constitute 'knowledge' in this more general sense unless also accepted as certain by the wider community.

At one level, education is about aligning the two – the subjective knowledge of the individual student with the authoritative knowledge of experts. This applies in cases where what constitutes generally agreed knowledge, shared by experts in the subject area concerned, can be clearly established.





Thus, if I as a novice do not know how to program using the *Flash* graphics software package, I learn how to use *Flash* by exposing myself to the knowledge of experts, and attempting to align *my* knowledge with *theirs*. I can tell that the experts' knowledge is 'true' or 'certain' in so far as my programming actually *works* when I apply it.

But often, truth or falsehood cannot be objectively established – particularly when we are dealing with topics and subjects which include *people* and *society* within their focus (as in the arts, humanities, and social sciences). In these areas, it is often more a case of establishing the relative merits of differing – often competing – views of what it is reasonable to believe.

For this reason, producing a piece of academic work on a topic is *not* just a case of showing that you have understood what you have been told by recognised experts (in lectures or books). This *may* apply to some extent where you are new to a subject and need to establish what are its basic tenets – i.e. what are generally agreed by the experts to be the basic concepts and building blocks of the subject.

But when you begin to move beyond the basics, you will generally find that things are less certain – less subject to general agreement. You begin to move to a level in which different people, different experts and different groups make different – often conflicting – claims.

Where things are uncertain, there is always the possibility that for any claim (proposition or assertion), there may be one or more counter-claims. Maybe the evidence on which the claim is based could be interpreted to produce a different claim. Maybe the evidence put forward to support the claim is just not sufficiently strong (or accurate) to justify the claim. Or maybe the evidence given is partial and ignores other evidence that weakens or even discredits the claim.

Any claim – whether it is made by the author of a book or lecture, or by yourself as the writer of an essay or report – should be supported by *evidence*. Your role as a critical thinker is to think:

To what extent is this claim truly supported by this evidence?

Can the evidence presented be interpreted in a different way – to support a different claim?

Is there any counter-evidence that has not been considered?

If so, does a different picture emerge when this evidence is also taken into account?

You should address these questions both to the claims made in the information sources you read and to the claims you make in your own work. Bear in mind that these same questions will be asked about your essay or dissertation by the person who is marking it.

At this level, you need to make yourself aware of, and to evaluate, differing claims in relation to the topic you are writing about. Different claims may derive not necessarily from any errors in evidence (although they *may*), but rather from different (but legitimate) perspectives and points of view. You need not only to be aware of and understand them, but also to weigh up their relative merits and limitations, and decide where *you* stand – and why – in relation to them. This is the essence of critical thinking. It entails considering the evidence supporting different claims.





In the academic world (as indeed in many other aspects of life) we use the notion of evidence as a bridge to enable people to discuss, argue and attempt to convince one another of how strong or reasonable their claims are. Evidence consists of the reasons you put forward to justify your claims. When you write about something for an essay or dissertation, you are expected to put forward *evidence-based* claims – assertions and propositions (saying that such and such a thing is or may be so) backed up by evidence supporting them. By considering this evidence, the reader can weigh up the extent to which he or she considers them to be justified.

In an essay or dissertation, the evidence supporting the claims you put forward will include citations to authoritative sources that support the claims. Thus, there is a big difference – in terms of the quality of your work, and the resultant mark you are likely to receive – between the following versions of the same claim:

'Females tend to be better at expressing positive emotions when using social networking sites.'

'Females tend to be better at expressing positive emotions when using social networking sites (Thelwall, Wilkinson and Uppal, 2010).'

The second version of the claim would link to the following entry in the References section of your essay or dissertation:

Thelwall, M., Wilkinson, D. and Uppal, S. (2010). Data mining emotion in social network communication: Gender differences in MySpace. *Journal of the American Society for Information Science and Technology*, 61(1), 190–199.

As well as making evidence-based claims, you will also need to build evidence-based *arguments*.

THINK

Write down what you think the difference might be between a *claim* and an *argument*.





I use the term *argument* here to refer to a *series of connected claims*. These claims should fit together to form a structured answer to your essay or research question. This is very different from a series of relatively unconnected claims. In fact, as we will see in the next chapter, lack of connectedness is a common problem and cause of low marks in essays and reports.

There are many different types of argument. In the sense in which I am using 'argument' as a 'series of connected claims', analysis, synthesis and evaluation are all types of argument. The following very simple examples express the essence of *analysis*, *synthesis* and *evaluation*. The *argument* in each case is shown in bold. The individual claims (upon which the argument is based, and which themselves will be evidence-based as previously described) are shown in italic.

Analysis:

The main elements of X are ... *The first element is... [details]. The second element is... [details]. Etc.*

Synthesis:

X and Y may appear very different... [details of the differences]. However, **they are similar in that...** [details of the similarities].

Evaluation:

X has both benefits and drawbacks. However, **I think that the benefits outweigh the drawbacks because...** [details].

If the argument that you are putting forward is someone else's argument – i.e. an analysis, a synthesis or an evaluation that you have found in an authoritative information source – then the 'evidence' supporting it will generally be a reference to that source. However, if you are making an argument yourself, then the 'evidence' supporting it will be its 'reasonableness'. What might count as 'reasonable' is discussed below in relation to each type of argument:

Analysis:

The main elements of X are ... The first element is... [details]. The second element is... [details]. Etc.

If it is *self-evident* that the main elements of X are what you say they are, then this 'self-evidence' is your evidence. If it is not self-evident, then you need to explain *why* the reader should accept that it is so, in a logical and defensible way. It is important to play 'devil's advocate' and try to see whether there is any way in which a cynical (but reasonable) person could argue that X cannot be broken down into the elements that you propose – or that the elements you propose are not 'the main' elements as you are arguing. If you can see a possible counter-argument to your own, you will need to think – and say – why the reader should accept *your* analysis.





Synthesis:

X and Y may appear very different... [details of the differences]. However, they are similar in that... [details of the similarities].

Again, if it is self-evident, then this 'self-evidence' is your evidence. If not, then you need to explain *why* the reader should accept that it is so in a logical and defensible way. As above, it is important to play 'devil's advocate' and try to see whether there is any way in which a cynical (but reasonable) person could argue that X and Y are not similar in the way you argue that they are. If you can see a possible counter-argument to your own, you will need to think – and say – why the reader should accept *your* analysis.

Evaluation:

X has both benefits and drawbacks. However, I think that the benefits outweigh the drawbacks because...

If you give logical and defensible reasons why the benefits outweigh the drawbacks, then these constitute your evidence. Once again, try to anticipate any counter-arguments – e.g. that in certain circumstances (maybe that you have not considered) the benefits may not outweigh the drawbacks.

Thus in an essay or dissertation you are attempting to convince those who read it (especially, the person who will mark it) that what you have said is justified. The person marking your work need not necessarily *agree* with what you say. He or she may have a different point of view. But he or she must regard what you say as *reasonable* – that is, supported by appropriate evidence.

One of the key goals of university education is that you learn how to develop effective evidence-based claims and arguments, and to evaluate the strengths and weaknesses of the claims and arguments of other people, for yourself. It is true that you will also need to become familiar with widely accepted beliefs in the topics and subjects you are studying – with what is generally agreed by experts to be firm basic knowledge. But at more advanced levels, you will be expected to explore, and critically evaluate, different claims, arguments, evidence and perspectives.

At a basic level, you are concerned with discovering and coming to understand the key concepts generally agreed by experts as constituting the key building blocks of the topic. As you move from basic understanding to more advanced issues, you generally find differences of views and opinions amongst different writers and experts in the subject – and often conflicting evidence. These differences imply an increasing need to be able to evaluate their merits and limitations, to make choices between them, and to justify your evaluations and choices. This will require increasing involvement in critical thinking – the careful evaluation of alternative claims, arguments, evidence and perspectives.



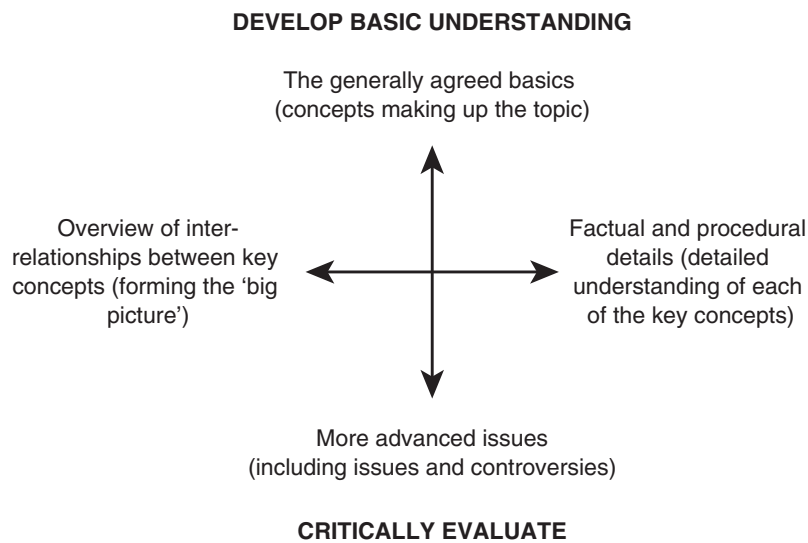


Figure 2.2 Basic dimensions of learning

Essential learning components

The vertical dimension of Figure 2.2 shows the different levels of understanding – from basic to more advanced – discussed in the previous section. However, your learning (at all levels of the vertical dimension) will also entail the horizontal dimension shown in the figure.

- (a) The left half of the diagram relates to the development of an overall view showing how the main concepts making up the topic interrelate and fit together to form an integrated ‘big picture’.
- (b) The right half relates to the more detailed examination of the individual components making up the topic.

You need both of these elements. One without the other results in incomplete understanding, and your work would be marked down accordingly.

If the detailed treatment of the individual components (element (b)) is not complemented by a view of how they all fit together to form the bigger picture (element (a)), the result is likely to be ‘not seeing the wood for the trees’ – fragmented understanding that misses fully appreciating the ‘big picture’.

Equally, the overview of how the components interrelate to form an integrated whole (element (a)), if based on only partial or incorrect understanding of the components (element (b)), may result in invalid over-generalisation. Over-generalisation occurs when you present an overview without sufficient supporting detail to validate it. Such an overview may be inaccurate and misleading if examination of the components at a more detailed level fails to support the pattern of interrelationships (the overview) you are claiming.



Figure 2.3 Description building is concerned with overall design

Source: http://commons.wikimedia.org/wiki/File:Example_of_CAAD.jpg
Author: Euy. Creative Commons Attribution-Share Alike 3.0 Unported license
(<http://creativecommons.org/licenses/by-sa/3.0/deed.en>).

Although by no means exclusively, component (a) places particular emphasis on *synthesis*, and component (b) places particular emphasis on *analysis*. As previously noted, analysis entails *breaking something down into its component parts* and examining these in detail. Synthesis entails *looking for ways in which things can be linked together*. It emphasises looking for ways in which they are similar and for things they share.

These different components were termed ‘descriptions’ and ‘procedures’ by Gordon Pask, a key figure in research into teaching and learning in higher education.⁵ Effective learning in any subject entails both ‘description building’ and ‘procedure building’, which he characterised in architectural terms. Description building is like creating the overall design of a building (as in Figure 2.3).

Procedure building, on the other hand, is concerned with the detailed operations and logistics that are necessary if the building is to function, such as plumbing, electrical wiring, and so on (Figure 2.4).

Both description building and procedure building are required to create a successful building. In the same way, both elements are required to build effective understanding in a subject. Description building is all about *relating ideas to synthesise a conceptual overview*. Procedure building is all about *analysing the factual and procedural details that support the overview*.

⁵Ford, N. (2000). The increasing relevance of Pask’s work to modern information seeking and use. *Kybernetes*, 30(5/6), 603–629.

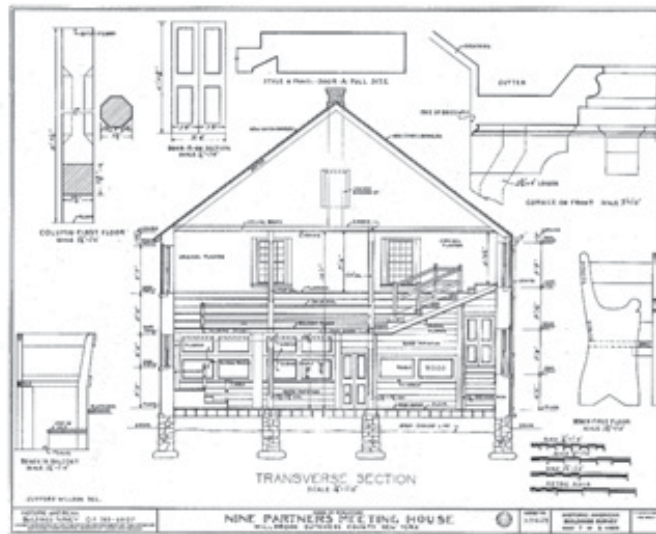


Figure 2.4 Procedure building is concerned with detailed operations and logistics

Source: <http://commons.wikimedia.org/wiki/File:Nine-parteners-meeting-house.png>
 Author: Wilson, Clifford. Public domain.

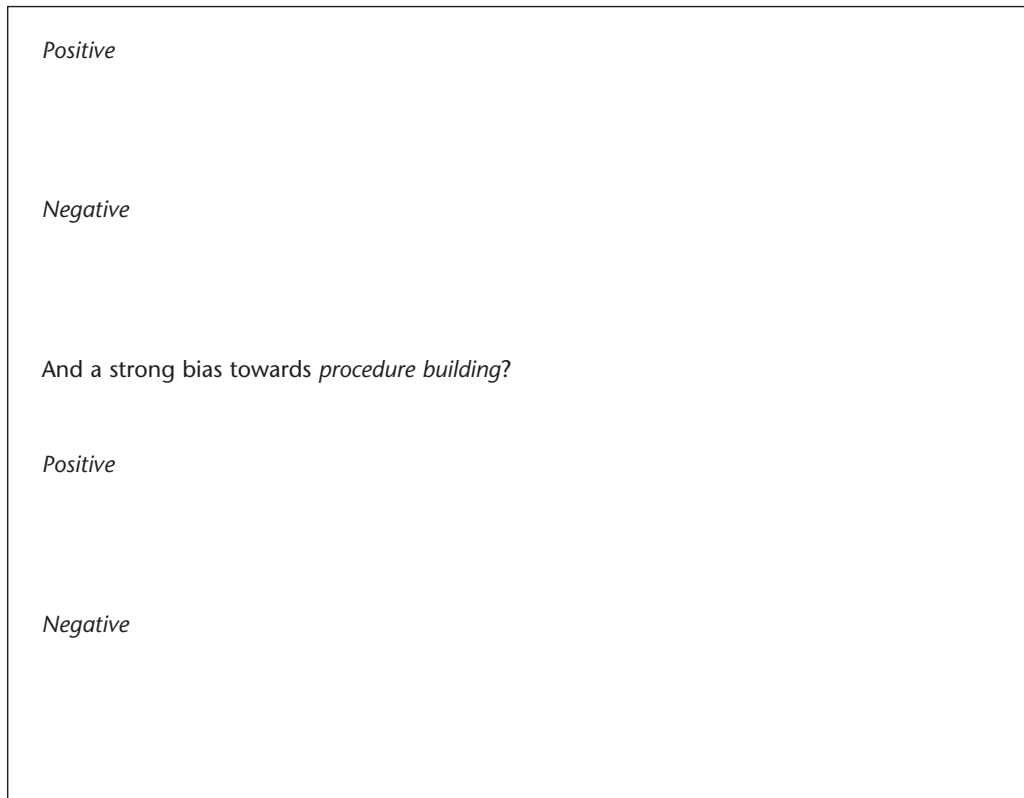
We are now about to go on to explore the notion of learning styles. However, if you would like to take a simple test designed to help you identify your own personal style, you should do so before reading the next section, and you should turn now to the Appendix and complete the short test you will find there.

However, although both description building and ‘procedure building are necessary components of full understanding, the order in which they take place may vary according to the individual learner. Pask did much work investigating these components of understanding, and he identified distinct learning styles associated with them. Some people, it would seem, have a bias towards (and are more adept at) description building. Others are biased towards procedure building.

The test of learning style in the Appendix is designed to tell you whether you have: a relatively holistic *description-building* style; a more step-by-step *procedure-building* style; or a *versatile* style in which you are able to engage in description building and procedure building in equal measure.

THINK

Can you think what might be the effects – both positive and negative – of having a strong bias towards *description building*?



Pask found that a bias towards description building without sufficient procedure building resulted in the distinctive ‘over-generalisation’ learning deficit previously described. A bias towards procedure building without sufficient description building results in the complementary ‘not seeing the wood for the trees’ learning deficit.

Even though you may possess skills in both elements of learning, and engage in both description and procedure building, you may still exhibit a stylistic preference for the order in which you do them. Two students may go about learning in stylistically very different ways, arriving at the same end-point (full understanding) via different routes. Even successful, high-achieving university students may display these preferences.

Typically, the student with a description building bias will seek to establish a good overview of the topic or subject early in the learning process. Once he or she has sketched this overall picture of the topic – what its main components are and how they seem to relate to each other – he or she will then go on to explore the details of the components, and the precise logic of how they fit together.

In contrast to this somewhat top-down approach, the student with a procedure building bias will tend to adopt more of a bottom-up, ‘brick-by-brick’ approach, starting by building up detailed understanding of a part of the subject and, having mastered this aspect, moving on to the next. The ‘big picture’ will emerge relatively late in the learning process.

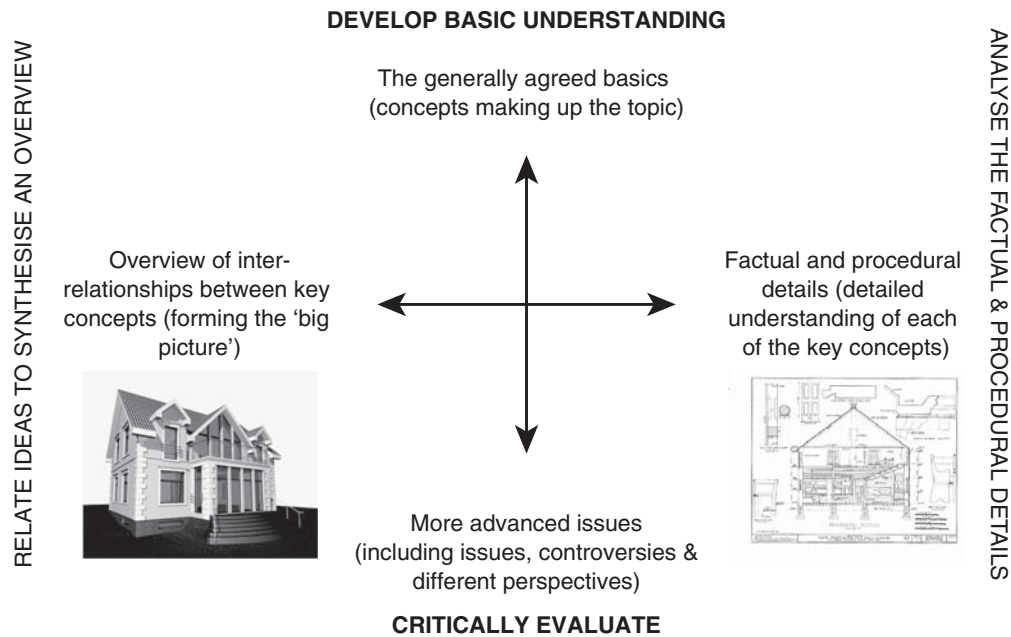


Figure 2.5 Description and procedure building mapped on to the basic dimensions of learning

Pask found that these biases are also associated with different learning processes. Strong description builders tend to be ‘parallel processors’, focusing on a number of aspects of the topic at the same time as they broadly – and initially quite speculatively – explore a new topic, trying to gain an overall grasp of what it is all about. Strong procedure builders tend to prefer a more sequential, ‘step-by-step’ approach concentrating on one thing at a time.

Importantly, there is evidence that if students go about learning in a way that *mismatches* their stylistic preference, their learning may be detrimentally affected, and they may not successfully integrate both components. Conversely, the learning of students working in a way that *matches* their style may be enhanced. As we will see in Chapters 3 and 7, these stylistic biases and preferences also have important implications for the way in which you go about searching for, and using, information for your essays and projects.

Figure 2.5 maps description building (represented by the thumbnail image to the left) and procedure building (the image to the right) on to the dimensions of learning previously presented in Figure 2.1.

The stylistic differences outlined above are reflected in the way in which you move between left and right as you progress downwards from basic to more advanced levels in Figure 2.5. The procedure builder is likely to focus more strongly on the right of the figure as he or she progresses downwards. The description builder will focus more on the left. In both cases, this is a matter of degree and not an absolute focus. Both will to an extent dip into elements of both left and right as their learning progresses.

We will be further exploring learning styles in relation to how you go about answering your essay or research question (Chapter 3) and the way in which you search for information (Chapter 5).

Summary

In this chapter, we have explored what you need to do to produce a high-quality response to an essay or research question. We have seen that you must go beyond simply demonstrating that you have *understood* the topic you are writing about. You need also to engage in *analysis* and *critical evaluation*, and this chapter discussed what these entail and why they are necessary.

We looked at how you should build an *evidence-based argument*, and went on to explore two fundamental components of understanding: *description building* (essentially, establishing a good conceptual overview of a topic); and *procedure building* (mastering the detailed evidence supporting and validating the overview).

Many people are stronger in one of these aspects of learning relative to the other, and these differences underlie different *learning styles*. How you can assess your own learning style, and the implications of style for how you go about learning and information seeking, will be explored in more detail in Chapters 3 and 7.

The issues explored here are general in the sense of underlying all learning and assessment. The next chapter will focus on specifics – how to analyse the precise requirements of particular pieces of coursework, and how to plan the way in which you will address these requirements in terms of building an appropriate evidence-based response.