

chapter 2

A CRITICAL MATRIX OF LEARNING AND TEACHING

This chapter focuses on learning, the central theme arising from the previous chapters. We present a wide range of relevant research and literature on learning pertinent to higher and professional education, and organize this research through two complementary frameworks. The first framework discusses the research on learning in terms of five learning gaps that students and teachers often face in the education of college and university students. The second framework proposes a critical matrix for constructing learning environments to transverse these learning gaps. This matrix integrates the intellectual, personal, social and practical dimensions of learning with key modes for structuring the learning environments: giving support, developing independence and encouraging interdependence.

THE ACADEMIC WEAVE

The previous chapter explored the first of two critical conceptual frameworks describing the language and practice of the teaching in higher education: a theory of the reflective professional within academic practice. This chapter will develop the second framework: a critical matrix of learning in higher education. In this framework, we address the key issue towards which our discussions so far have been moving – learning. Learning emerged in the first chapter as a central feature of the knowledge

specification that society contracts with higher education to deliver. There, it mainly focused on student learning and the challenges presented to teachers in higher education. Learning was not considered in terms of learning particular disciplines or areas of knowledge, but with issues of meta-learning (learning to learn) and transferable learning (and the development of transferable skills) within an increasingly changing, uncertain and contestable world. Learning, in this broad sense we argued, challenges the teacher to become a reflective professional.

In Chapter 1, we explored the dialogical and social constructivist character of learning. We considered this understanding of learning in the academic context in terms of two models of academic practice. These two models – *individual/monologue* and *relational/dialogue* – were consistent across the main academic roles of research and teaching. The monologic model, however, contributed to the fragmentation of academic roles, while the dialogic model offered the opportunity for the mutual regeneration of research and teaching through an understanding of learning as central to academic being. Not simply the outcome of one practice (teaching) and of marginal interest to another (research), learning provides the defining feature of both practices and is central to a comprehensive model of academic practice more generally and the reflective professional in particular.

In this chapter, we examine the nature of learning in detail, particularly as it relates to higher education, articulating the conceptual framework set out in this part of the book. Learning, as it relates to students, is not merely a set of concepts or principles that teachers in higher education should be aware of and reflect upon in their own professional practice, but rather frames the whole academic enterprise. Academics are not simply expected to help students meet the demands of their formal studies and the challenges in their lives beyond these studies, but also to meet the demand for ongoing learning themselves. In this sense, learning is situated, part of the ongoing social situation, fundamental to ‘life itself’ (Jarvis, 1992: 10). As such, it is the very weave of academic and professional being. For students to engage meaningfully in learning, they need to engage legitimately in that weave, admittedly as peripheral participants to begin with but, nevertheless, the learning experience needs to be legitimate, authentically emulating the expert academic and professional learning which is central to the community of practice (Lave and Wenger, 2000a; Wenger et al., 2002) into which they are entering.

Acknowledging learning as the social weave of academic and professional existence provides a useful starting point from which to address the sheer complexity and paradoxes (Jarvis, 1992) of learning. This weave of learning

encompasses a range of intellectual, personal, social, cultural, ethical, political, practical obligations, interests and concerns which students will need to both address and balance in their lives. These go far beyond the learning demands of specific discipline knowledge or of general transferable skills. Barnett uses Habermas' term 'life-world' to describe 'the total world experience of human-beings' (1994: 178) which higher education must address. He contrasts it with teaching that limits its practice to the intellectual 'academic competence' of discipline-world or to the practical 'operational competence' of work-world.

Teaching needs to address and engage the wider multiple discourses of the 'life world'. These may include, for example, an ability to respond meaningfully to and critique one's own responses to political debates, health issues, cultural matters, social and family relationships, works of art, diverse social groupings and ways of thinking, voluntary and charitable services, the media, leisure activities and even religious experience. It requires an ability to critique these from multiple frames and perspectives in open, democratic and socially just ways. It even demands the ability to critique one's grounds for critique. Learning so conceived is not a process of individual knowledge construction within a socially and culturally stable situation, but is unstable and uncertain precisely because, paradoxically, it is constructed within both an increasing globally connected world and an increasingly fragmented and changing world.

Faced with the complexity of the 'life-world' alongside its apparent limitless potential for change, describing the nature of this 'learning weave' is difficult, let alone developing strategies for facilitating, assisting, supporting, fostering and nourishing it. While it may be commonplace to assume that teachers organize learning, this is not the case. Teachers cannot manage the sum of their students' learning, for indeed, learning is not entirely (or even mostly) in the power of the teacher. To suggest otherwise would be naive. Teachers cannot substantially change the character and nature of individual abilities and styles of learning, predispositions towards different intelligences (Gardner, 1993), individual circumstances and histories *vis-à-vis* different educational issues or diverse social and cultural backgrounds. Nevertheless, despite the limits of their influence on 'presage' characteristics (Dunkin and Biddle, 1974) which students bring to the encounter, or the enormity of the teaching challenge, teachers cannot abdicate their responsibility for facilitating substantial learning. Teachers have a huge role and moral obligation in student learning.

Student learning has become a ripe area for research in recent years, developing a productive consensus in many areas. In the following discussion,

we shall frame our choices within two general structures. The first is considered within a schema of *learning gaps* (Cox, 1992) which characterize the present and future professional lives of our students. It is used for developing knowledge and understanding of the key issues across a wide range of research and scholarship relevant to student learning. The second presents a *critical matrix of learning*. It describes different ways of framing and shaping learning environments and the central features – knowledge, learner, assessment and community – which constitute them (Bransford et al., 2000). The matrix provides teachers with a conceptual tool for designing, developing and implementing their teaching across the various ‘genres’ of their teaching practice. Both provide useful conceptual charts for navigating the challenges of understanding and facilitating student learning.

LEARNING GAPS

As we saw in Chapter 1, teachers often see learning as an outcome in terms of a state of knowledge, which students achieve as detached selves, rather than as an outcome in terms of a process of constructing, which they achieve within a given social situation. While teachers may know what they would like their students to achieve, they frequently have a very limited idea of why students are failing to achieve. This situation, moreover, is picked up and acutely felt by students who have no idea of what the nature of the problem is. In such situations, the teacher’s response may be limited to rather unhelpful comments about, for example, the student’s exam results or coursework not being up to standard, or suggestions that the student is not working hard enough. A deeper understanding of why learning is not achieved is missing: it remains hidden in a kind of ‘shadow’ land. Here we explore some of the relevant research and literature in terms of how learning might occur. We do so within a framework of five learning ‘gaps’. Briefly, these gaps fall between:

- recall and understanding;
- understanding and ability;
- ability and wanting to;
- wanting to and actually doing; and
- actually doing and ongoing change.

These gaps lie within a continuum of different areas of learning – each encompassing the previous ones – laying out the extent of the professional challenge (see Figure 2.1).

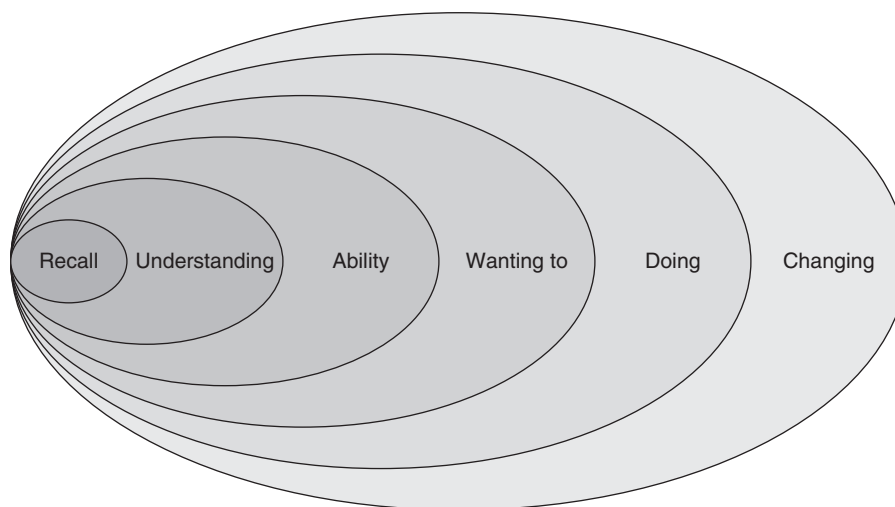


Figure 2.1 *Learning gaps*

At the most basic level, there is a *gap* between the ability of learners to recall or recognize information and being able to understand it. Even if understanding is achieved, however, there can then be a gap between that and being able to or having the abilities/skills actually to put that understanding into practice (practical understanding). In subjects like medicine and dentistry, it has long been clear that students may often be able to write reasonable examination answers and yet be incompetent when faced with real patients. Sometimes efficient learning situations can be devised which result in students with knowledge, understanding and the ability to use that understanding, and yet they end up not actually wanting to use it. The very efficiency of some systems may indeed contribute to turning students away from a real commitment to their subject or their work.

An even bigger gap, one that can be quite disturbing for teachers as well as students, occurs when the student understands, is able to put that understanding into practice, even wants to do so, but still does not actually do so. Of course, there are many excuses, such as timetabling or pressure of work, but there is often a great deal more to it than this.

A final gap – dealing with multiple competing perspectives – emerges with understanding, ability, wanting to and actual doing coupled with a failure to change as the situation of our practice mutates and changes. Many of these gaps have more to do with conceptions of self and the anxieties and threats which students (and teachers) perceive about them, rather than ignorance or lack of competence.

In exploring these gaps, we focus on key areas of learning. The organization we propose provides a holistic, integrated schema for approaching learning-in-practice, yet is not intended as an all-embracing model of learning. Indeed, such models often ‘get in the way of developing an understanding of the differing strategies necessary to enable diverse adults to learn different things in different settings in different ways’ (Hanson, 1993: 107). We explore competing traditions, examining their distinctive contributions for the development of teaching. Individually, they allow us to look at the pertinent features of particular gaps. Collectively, they establish a rich conceptual framework of learning that teachers might find useful in critically reflecting upon and improving their professional practice.

Motivation and learning

To a large extent, motivation characterizes the learning gaps. Traditionally, motivation has been viewed within two dimensions, intrinsic (a person acts out of spontaneous interest or an inherent satisfaction in seeking out novelty or challenges) and extrinsic (a person acts to attain a separate outcome) (Ryan and Deci, 2000). For Ryan and Deci (2000), distinguishing between intrinsic and extrinsic cannot fully encapsulate what moves people to act (or not). Indeed, they suggest that much of what people do is not intrinsically motivated at all. Human beings require autonomy and self-determination – a sense of choice and control over their own actions and environment – in order to grow and develop. People may be moved to act by a variety of factors, but only when the process is internally controlled and authentic (self-authored or ‘real’) will individuals be excited, interested and confident. We see this in persistence, creativity, enhanced performance, heightened self-esteem and wellbeing, which may be lacking when people feel more externally controlled (Ryan and Deci, 2000).

On one end of the motivational continuum, an individual may not act at all, or act without intent. This occurs when the person sees no value in an activity, lacks confidence or has no expectation of desired outcome. The activity is seen as completely beyond the individual’s perceived locus of control. Similarly, if an individual performs a behaviour to satisfy an external request, such behaviour may be viewed as controlled or alien (‘University regulations say that I need to attend class’). An individual might ‘take in’ a regulation, but not accept it; the behaviour is performed to avoid failure (guilt or anxiety) or to prove one’s worth (pride) (‘If I fail this course, my parents will not pay my tuition’ or ‘I have to do better than Denise and Marina’).

Moving along the continuum, an individual may perform a behaviour because he or she consciously values or owns it as personally important ('It's important that I receive top marks in university, because I've always identified myself as a top student'). Finally, although an individual may not be moved to act completely out of an innate sense of satisfaction, a person can come very close when regulations and behaviours are congruent with one's values and needs, and assimilated to one's self ('I really enjoying learning biology; this will help me one day when I am a doctor'). This is very close to intrinsic motivation, but is still considered extrinsic because the action is done to attain separate outcomes, rather than for inherent pleasure that is completely internally controlled. Essentially, motivation is enhanced when individuals feel a strong sense of control by being offered choices and autonomy. Ultimately, the decision to act depends on the degree to which a person 'internalizes' a value or regulation, and the extent to which he or she 'integrates' the value or regulation (makes it their own) (Ryan and Deci, 2000). Thus, motivation plays out differently in each of the gaps discussed below.

1. THE GAP BETWEEN RECALL AND UNDERSTANDING

The gap between the knowledge that a student can recall and her real understanding of that knowledge can be substantial. Essentially it is concerned with the distinction between seeing learning as simply the ability to remember and reproduce facts and ideas, or as the ability to understand and reconstruct those facts and ideas in terms of one's own experience. Researchers using a phenomenographic approach for analysing learning have focused on issues central to this gap. Phenomenography is a qualitative research programme that is concerned 'with what is culturally learned and with what are individually developed ways of relating ourselves to the world around us' (Marton, 1988a: 181). Phenomenographers 'do not make statements about the world as such, but about people's conceptions of the world' (Marton, 1988b: 145). The key contribution of this perspective – that learning occurs with 'a change in conception' (Dahlgren, 2005: 34) – is that 'what' we experience and understand of our social reality is inseparable from 'how' we experience and understand it (Marton et al., 2005).

Approaches to learning

While personality differences play some role in student approaches to studying and learning (Biggs et al., 2007), research has shown that students' approaches to learning are linked to their perceptions of their academic

Table 2.1 *Approaches to learning***Deep approach***Transforming*

Intention – to understand ideas for yourself:

- Relating ideas to previous knowledge and experience
- Looking for patterns and underlying principles
- Checking evidence and relating it to conclusions
- Examining logic and argument cautiously and critically
- Becoming actively interested in the course content

Surface approach*Reproducing*

Intention – to cope with course requirements:

- Studying without reflecting on either purpose or strategy
- Treating the course as unrelated bits of knowledge
- Memorizing facts and procedures routinely
- Finding difficulty in making sense of new ideas presented
- Feeling undue pressure and worry about work

Strategic approach*Organizing*

Intention – to achieve the highest possible grades:

- Putting consistent effort into studying
- Finding the right conditions and materials for studying
- Managing time and effort effectively
- Being alert to assessment requirements and criteria
- Gearing work to the perceived preference of lecturers

Source: Adapted from Entwistle, 2005: 19

environment, particularly to the perceived quality of the course, in terms of the content, context and demands of the learning task (Richardson, 2005). Phenomenographic research on student learning has suggested that there are three qualitatively distinct approaches to learning: deep, surface and strategic (Entwistle, 2005) (see Table 2.1).

Students who take a *deep* approach to learning intend to understand the subject in a way that is personally meaningful, engaging their own experience and previous knowledge in an interactive (dialogical) process with the relevant content, logic and existing evidence of the subject. Learning is essentially a transformative experience in which the students make or construct personal meaning out of the shared meanings available. Their intention is to understand ideas for themselves by constructing their own meaning. On the other hand, students who adopt a *surface* learning approach intend to *use* or *reproduce* the available meanings in an instrumental way to deal with course requirements. The students will use the meanings, but perceive them as alien and externally imposed. As such, they are often simply approached through memorization or reproducing the course

material; there is no sustained personal engagement with the student's own experience and their previous knowledge. Learning is a reproductive experience and students who take a surface approach often struggle with new material and may feel pressured in their work.

The *strategic* approach to learning is sometimes seen as adopting elements of both the surface and deep approaches. *Strategic*-focused students are mainly concerned with achieving the highest possible grades, and tend to be alert and responsive to the cues they pick up about the nature of the tasks and demands made upon them. They will seek to determine and meet the instructor's learning outcome preferences. Learning is essentially an organizing experience in which effort and time are strategically managed to achieve the best grades. Even students who are inclined to take a deep approach to their learning will at times find it is more strategic to employ a surface approach if, for example, the assessment methods suggest that memorization of facts will meet the requirements more effectively (Entwistle, 2005).

Study orientations

The categories of approach to learning correlate significantly with similar dimensions disclosed in a range of other research on student learning (Entwistle, 2005). They have, for example, been linked to three general *orientations* to study: *meaning*, *reproducing* and *strategic* (Ramsden, 2003). Pask (1976) has also reported similar distinctions in learning, contrasting 'comprehension learning' which uses analogies to build up meaningful descriptions of topics by emphasizing the outline of ideas and interconnections, with 'operation learning' which relies on a step-by-step, logical approach often emphasizing the reproduction of factual details. Biggs (2003) distinguishes between *intrinsic* (meaning-oriented) and *extrinsic* (outcome-oriented) motivations in student learning. Students are intrinsically motivated to learn when the task or activity intrigues them, and motivated extrinsically when they perform a task to achieve a specific outcome. He also identifies an *achievement* motivation where students learn in order to compete against other students.

Conceptions of learning

Students will also hold a *conception* of learning that may be different from their approach to learning and studying. The idea of 'conception of learning' grew out of the original research on approaches to learning. A conception of

Table 2.2 *Conceptions of learning*

1. A quantitative increase in knowledge	
2. Memorizing	<i>Reproducing</i>
3. Acquisition of facts and methods, etc.	
4. The abstraction of meaning	
5. An interpretative process aimed at understanding	<i>Transforming</i>
6. Developing as a person	

Source: Marton et al., 1993

learning, however, refers to the general perceptions or preconceived ideas of learning from past experiences that students bring to the learning context (Marton and Saljo, 2005). Conceptions of learning describe students' (and teachers') broad experience or understanding of what learning consists. An individual can also have a conception of a discipline or subject, such as history or mathematics (Entwistle, 2005), or a conception of a particular practice such as essay writing (Hounsell, 2005) or creative writing (Light, 1995). Even more narrowly, a conception can describe how students understand a particular topic or idea in a syllabus. We focus here on the wider application of this concept as a key descriptor of more general ideas and understandings of learning. Table 2.2 presents six learning conceptions divided into two general categories: *reproducing* and *transforming*.

The contrast between reproducing and transforming conceptions corresponds closely to the above distinctions in both approaches to learning and learning orientations described above: a correspondence demonstrated by Van Rossum and Schenk (1984). It is very difficult to encourage the development of deep approaches to learning in a particular learning situation with students who hold a general reproducing conception of learning. These conceptions may also be seen as constituting a developmental continuum. Students may enter higher education with initial reproducing conceptions, but are expected to leave with more developed 'transforming' conceptions. Their more general learning will largely rest in such change. The research describing conception has essentially been characterized by a cognitive perspective. The sixth conception, developing as a person (which was added later), indicates features of conception that go beyond the cognitive to encompass more personal characteristics, although these are not fully developed.

Entwistle and Entwistle (1992) suggest that understanding is best viewed 'not as a cognitive process, but as an experience' characterized by feelings of satisfaction, confidence and significance. In their study of conceptions of learning, they describe a hierarchy of the forms of understanding described by students. At the least sophisticated level, the student is 'limited to grasping material presented directly by lecturer or through required reading' (Entwistle

and Entwistle, 1992: 13) and is basically concerned with remembering facts or procedures. In contrast, at the most sophisticated level, the student independently and actively develops his or her own structures and extends the breadth of material across topic, course and discipline.

This research on learning approaches, orientations and conceptions enables us to reflect on how our pedagogical strategies, and the teaching and learning environment we establish, might aid or hinder students' negotiation of the gap from recall to a more genuine understanding. Students' choices of assessment, what they choose to study and how they choose to study, as well as their workload and the overall quality of teaching, all play an important role in the development of learning (Ramsden, 2005). Bridging this first gap is a valuable starting point, but it is not enough.

2. THE GAP BETWEEN UNDERSTANDING AND HAVING THE ABILITY/SKILLS TO PRACTISE EFFECTIVELY

We might expect, from the above discussion, that a student who takes a deep or transforming approach to learning – with its emphasis upon meaning making and the relationship to personal experience – to be more likely to possess the abilities to perform than a student taking a surface or reproducing approach. Research, however, has not generally made a great deal of this relationship, tending to focus on the purely intellectual arena with less importance given to practice.

Experiential learning

The work of Kolb (1984) and others who stress the critical importance of experience in learning help explain the gap between understanding and having the ability and skills to practise. In his now classic work, *Experiential Learning* (1984), Kolb develops a comprehensive theory of learning that stresses the fundamental role of experience in learning: '*Learning is the process whereby knowledge is created through the transformation of experience*' (Kolb, 1984: 38, emphasis in original). Echoing the idea of learning as a 'transformation' in the previous section, experiential learning focuses on a transformation that is both active by definition and explicitly grounded in the concrete social environment in which experience occurs.

Building on Dewey (1938), Kolb describes experience as a transaction between an individual and what, at the time, constitutes his environment. It is a 'fluid interpenetrating relationship such that once they (person and environment) become related, both are essentially changed' (Kolb, 1984: 36).

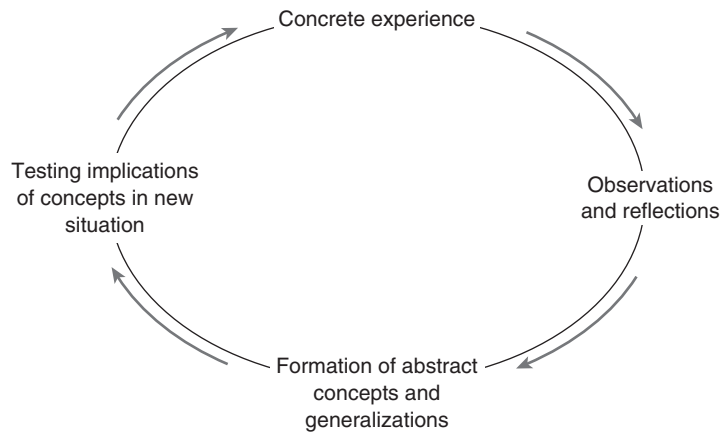


Figure 2.2 *Experiential learning cycle*

Source: Kolb, 1984: 21

Drawing on the organizational development work of Lewin (1951), Kolb further argues that learning is ‘best facilitated in an environment where there is a dialectic tension and conflict between immediate, concrete experience and analytic detachment’ (1984: 36). He has concisely illustrated his theoretical discussion in the widely used cycle of experiential learning (see Figure 2.2). In this four-stage cycle, immediate concrete experience provides the basis for observation and reflection. These observations are, in turn, assimilated into abstract concepts and generalizations (‘theories’) from which implications for action can be read and developed. These implications may be regarded as ‘hypotheses’ that then serve as guides for action, for testing in new concrete situations and, thereby, for generating new concrete experiences.

The experiential learning cycle incorporates a feedback process directed towards active experimentation and the abilities/skills that that requires. In higher education, such abilities will differ according to different curricula but may include such things as:

- writing essays and reports;
- giving presentations;
- engaging in discussion;
- leading discussion;
- working on a task as part of a team;
- performing experiments;
- solving a group problem;

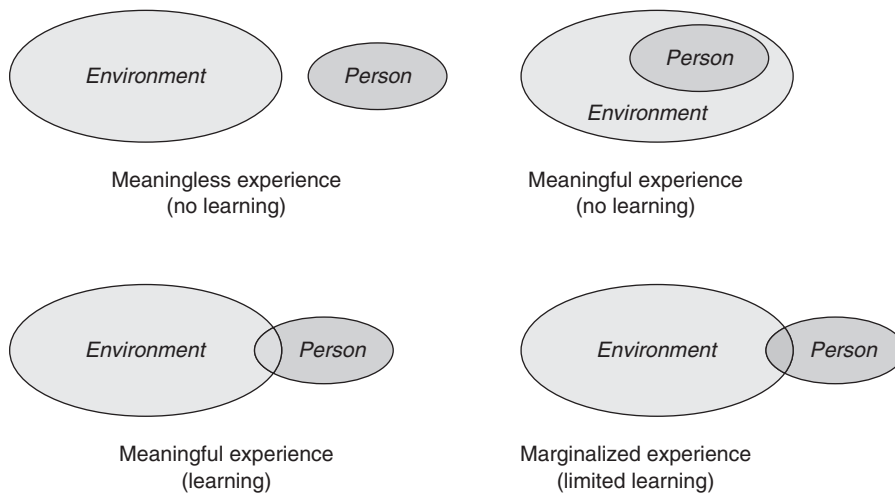


Figure 2.3 *Learning: response to experience*

- engaging in research;
- carrying out clinical duties;
- undertaking projects;
- assessing peers; and
- evaluating teaching and learning environments.

At its most effective, this learning cycle ensures critical and reflective, goal-directed action and evaluation of the consequences of that action. Although the Kolb cycle has been criticized for not fully capturing the complexity of the process (Jarvis et al., 1998: 48) and for leaving out important aspects of experience such as emotions and feelings (Boud, 1995), its main contribution, for our purposes, is the intrinsic space it provides within active learning for the development of the skills and abilities inherent in the generation of new and meaningful experience.

Experience and meaning

An important feature of the effectiveness of an experiential learning cycle is getting the balance right between experience, reflection, theory and the action they lead towards. While one must be careful about reducing what is essentially a holistic cycle to constituent parts, it does provide a way of looking at problems that may be blocking the achievement of learning. Not all experience, for example, is 'meaningful' or results in learning. Figure 2.3 illustrates a series of relationships between experience and learning.

Meaningful experience requires an initial set of premises or meanings – knowledge, skills, attitudes, values, beliefs, etc. – be shared between the student and their specific learning and teaching environment. Learning, paradoxically, requires a ‘disjuncture’ in the sharing of meanings: ‘disjuncture, or discontinuity, between biography and experience of the wider world is a fundamental condition of human learning’ (Jarvis, 1987: 80). If there is a full overlap of meanings, while it may be meaningful, it will not result in new meanings or learning. There is nothing new to the learner, nothing to be learnt. Indeed, the overlap may be so complete, repetitive and unchangeable as to be oppressive and alienating.

On the other hand, a full ‘disjuncture’ between the student’s life-world and the situation will render the experience meaningless. There is nothing for the learner to make a connection with. Importantly, life-world experience can be marginalized by the learning environment so as to undermine the possibility of meaningful connections. While there is an overlap of relevant meanings between the student and the environment, the prevailing authority and discourses within the environment are perceived as not accepting or permitting the student’s experience – for a range of social reasons including issues of class, gender, age, ethnicity, etc. (Light, 1996) – and thereby limit the student’s learning.

Stereotype threat

In recent years, more attention has been paid to ‘stereotype threat’ – the idea that learning environments that raise prevailing social stereotypes around academic ability can trigger significant hurdles to learning in even the most intellectually able students whose experience of ethnicity, race, gender or class is linked to those stereotypes (Steele, 1997). Members of stereotyped groups may feel extra pressure or anxiety about performing if they believe that their performance will confirm a negative reputation, such as women’s ability to perform quantitative work or African-Americans’ ability to achieve a high score on standardized tests (Steele, 1997; Aronson et al., 1999). As Rodney Ellis, an African-American state senator from Texas, once remarked: ‘For some reason I didn’t score well on tests. Maybe I was just nervous. There’s a lot of pressure on you, knowing that if you fail, you fail your race’ (1997, cited in Aronson et al., 1999: 29). In the short term, the individual’s academic performance may be injured, but faced over the long term, stereotype threat may invoke a sustained defence ‘against the chronic exposure to ability impugning stereotypes and the low performance that it can provoke – a disengagement or “disidentification” from the threatened domain, a dropping of the domain as a basis of self-esteem’ (Aronson et al., 1999: 35).

While stereotype threat is often associated with members of minority or under-represented groups, Aronson and his associates (1999) further found that members of any social group can be affected negatively by stereotypes, enough to impair their academic abilities, even if that person is not regularly subjected to stereotyped assumptions. For example, researchers suggested to high-achieving white males that a group of achieving Asian males might outperform them on a standardized maths exam. The results showed a sharp decline in intellectual performance ‘much like the members of groups for whom stereotypes regarding their intellectual abilities *do* exist and *are* widely known and cognitively available. Clearly, then, chronic feelings of stigmatization were not a necessary factor in their underperformance’ (Aronson et al., 1999: 40). But they did have to care about their personal identity in terms of performing well, in order to be bothered by the underlying assumption of the stereotype that they lacked a valued ability.

Reflection and experience

Like the social meanings imbedded in the personal experience students bring to the learning situation, reflection on that experience is also a more complex relationship than is often thought. Responses to experience may result in non-reflective as well as reflective forms of learning (Jarvis, 1987). Non-reflective learning includes reproductive practices such as memorization, imitation and the development of rote skills. Reflective learning includes contemplation, experimental learning and the development of reflective skills. Boud and Walker (1998) point out that ‘acts of reflection can become ritualized’, particularly when they are encouraged, even imposed through prescribed activities within the learning situation.

Reflection, like experience, is context dependent, sensitive to the social and political environment in which it occurs. Reflective learning may also occur during action or actual experience. Schon (1983) distinguishes ‘reflection-on-action’ – which the Kolb cycle suggests – from ‘reflection-in-action’ occurring simultaneously with an activity or practice. Argyris and Schon (1978) also differentiate between two theories of action employed in practice: ‘espoused-theory’ used to explain actions and ‘theory-in-use’ that actually governs practices and actions. An existing but incompatible theory-in-use may inhibit learning new ‘theory’. Although a student may appear to have a new understanding, their actual skills and abilities are not being developed, as they are still embedded in already fixed theories.

Table 2.3 *Learning environments*

1. Affectively complex	2. Perceptually complex
<ul style="list-style-type: none"> • Focus on here-and-now experiences, legitimization of expression of feeling and emotions • Situations structured to allow ambiguity • High degree of personalization 	<ul style="list-style-type: none"> • Opportunities to view subject matter from different perspectives • Time to reflect and roles (e.g. listener, observer) which allow reflection • Complexity of multiplicity of observational frameworks
3. Symbolically complex	4. Behaviourally complex
<ul style="list-style-type: none"> • Emphasis on recall of concepts • Thinking or acting governed by rules of logic and inference • Situations structured to maximize certainty • Authorities respected as caretakers of knowledge 	<ul style="list-style-type: none"> • Responsibility for setting own learning goals • Opportunities for real risk taking • Environmental responses contingent upon self-initiated action

Learning environments

The literature associated with the gap between recall and understanding revealed the key role the pedagogical formation of the learning situation plays in relation to student learning. The experiential learning literature linked to the gap, here, between understanding and ability focuses our attention on the role of the learning situation in construing experience, and the students' opportunities for developing abilities and skills to put their understandings into practice. Working through its implications leads to a more complex and differentiated view of learning environments.

Kolb, for example, analysed four different types of environment (see Table 2.3), which illuminate the affectively complex, the perceptually complex, the symbolically complex and the behaviourally complex. It is worth noting that the 'symbolically complex' environment (in Table 2.3) maps closely to the 'teacher-oriented' transmission teaching conceptions described in the last chapter. The other three, however, begin to map the learning environment more closely to different aspects of the 'learning-oriented' teaching conceptions. While this experiential learning perspective may aid us in the alignment of teaching and learning environments more conducive to promoting skills and the ability to put understanding into practice, designing learning environments to meet the wide range of learning needs and wants of students is still problematic. Indeed, this may be particularly the case with today's millennial students who, as research suggests, may enter college as high achievers, and yet in their pressure to perform may paradoxically lack

basic problem-solving and decision-making skills and abilities (Howe and Strauss, 2003).

Learning environments that focus specifically on providing students with the experience of learning in the context of real-life problems have become more common at institutions of higher education, since they first emerged in the late 1960s. Such environments are designed around problem-based learning, project-based learning, inquiry-based learning and inquiry-guided learning activities. They may differ in implementation and structure. For example, in problem-based learning, an entire course or curriculum may be designed around a problem (Boud and Feletti, 1997/2001), while in inquiry-based learning, the problem may be the focus of one lecture or one assignment (Lee, 2004). They do, however, employ similar approaches, requiring students to tackle one substantial, open-ended or 'ill-structured' question or problem, or a set of related questions and problems. Students often work in groups or teams to address the problem, although individual self-directed learning is also expected.

3. THE GAP BETWEEN HAVING THE SKILLS/ABILITIES AND ACTUALLY WANTING TO USE THEM

It may be that courses and degrees which are effective in increasing knowledge, encouraging understanding and the acquisition of appropriate skills and abilities will also, almost as a corollary, be effective at developing a willingness, even an aspiration, to go on learning or working in a particular field. Yet many courses encourage the feeling that, after the certificates and the degrees have been awarded, the books will be shut for good. And while the accumulation of qualifications and letters after the name might have its own emotional satisfaction, in the present social and economic climate, the experience of learning needs to be a willing part of lifelong professional development. Certainly the immense satisfaction that so often arises in understanding and deriving meaning from almost any aspect of life – from the jigsaw puzzle to the most complex questions of nature – is a crucial part of *wanting to*. This is particularly true of meaning which one is able to integrate with one's own experience and put into practice. Nevertheless, for a variety of reasons this may not be sufficient. Wanting to and a corresponding commitment to act may falter.

Drawing on his long work with students at Harvard, Perry (1970, 1998) became very concerned with this question of commitment. He found that very often there is a distinctive developmental process related to students' changing conceptions of learning, teaching and knowledge, which is at the same time part of a more personal development involving emotional issues

of personal commitment. He identified a complex developmental process illustrating how the progress of students through higher education is punctuated by a number of important positions and transitions which often have a profound influence on their learning. His widely reported 'scheme of intellectual and ethical development' – depicted here in a simplified version (see Table 2.4) – describes nine positions in student development (Perry, 1998).

The first three positions in Table 2.4 move through a dualistic perspective in which the student regards knowledge and learning as something external and objective, right or wrong. This sort of epistemological perspective is extremely difficult to give up if it is held with any conviction, a conviction that quite often goes back to early childhood and may be strongly invested with emotion. Teachers and the learning environment may have been vested with many of the qualities of parental or childhood authority figures. The difficult transitions from the security of dualism into the insecurity of relativism is not simply a matter of absorbing new ideas or information, but is very much a restructuring at an emotional as well as a cognitive level, and may be accompanied by extreme anxiety. If, on the other hand, the student remains defensive about uncertainty, they may become certain with a comparable conviction that anything goes and that there are no valid reasons for anything!

The move into the final three positions can again be accompanied by anxieties where the student recognizes learning as making and balancing commitments within relativism, within ever changing situations. When students make this move, however, commitments may be an extremely important source for wanting to do things. Longer-term and deeper commitments will arise out of seeing that commitments need revising because of deeper understanding and new experiences. Wanting to do things becomes part of a new, evolving structure and one which will hold interesting challenges and new perspectives in the future (Perry, 1998).

Perry's model has been critiqued and developed by scholars concerned that his scheme of intellectual and ethical development did not adequately encompass the decision-making frameworks and worldviews of others beyond the mostly male Harvard students interviewed in his original study. Most notably, Belenky and associates (1997) considered the epistemological development of women. They grouped 'women's ways of knowing' into five major epistemological categories:

- *Silence* (women experience themselves as 'mindless and voiceless and subject to the whims of external authority').
- *Received knowledge* (women view themselves as receiving, or reproducing knowledge, from external authorities, but unable to create their own knowledge).

Table 2.4 *Intellectual and ethical development*

	1	The student sees answers as right or wrong; authority is accepted
	2	The student sees diversity between authorities: some are frauds, the true authorities are right
<i>Dualism modified</i>	3	The student accepts diversity as temporary until the authorities get the truth
	4	Where there are no right answers the student accepts everyone has a right to his opinion. No one is wrong!
<i>Relativism discovered</i>	5	Student accepts in certain courses authorities are not asking for right answers but for thought
	6	Student sees all knowledge as contextually relative
<i>Commitment in relativism developed</i>	7	Student sees a need for some form of personal commitment within an uncertain world
	8	Student sees need to make several commitments
	9	Student accepts that making, revising, pulling apart and creating new commitments is an unfolding and on-going process

Source: Perry, 1998

- *Subjective knowledge* (women view truth and knowledge as ‘personal, private, and subjectively known and intuited’).
- *Procedural knowledge* (women are ‘invested in learning and applying objective procedures for obtaining and communicating knowledge’).
- *Constructed knowledge* (women perceive all knowledge as contextual, consider themselves to be creators of knowledge and ‘value both subjective and objective strategies for knowing’) (Belenky et al., 1997: 15).

Intellectually effective and efficient teaching practices are frequently not sufficient to encourage students to put their understandings into practice. They must at the same time understand and construct the social and emotional context for wanting to make commitments. Paradoxically, much successful teaching does not consist of finding ways for constructing knowledge, but of ways for deconstructing some of the fiercely dualist and even purely relativist positions to which students cling. Such positions constrain them from wanting to make commitments and to put into practice their developing understandings and skills.

4. THE GAP BETWEEN HAVING THE ABILITIES, WANTING TO USE THEM AND ACTUALLY DOING SO

From the previous section, we can see that the teaching environment supporting the development of wanting to involves much more than simply providing knowledge and skills. A genuine wanting-to requires a significant degree of change in many of the ways students perceive and

understand knowledge and, indeed, the world in which their intellectual, personal and social commitments must be made. There is a resonance here with the ‘developing as a person’ aspect of the transforming conceptions of learning discussed above. And yet the deeper changes associated with wanting to are often not enough to bring about action, to instigate an actual doing. An important gap may exist between wanting to do things and actually doing them.

Research has shown, for example, that students avoid seeking help in the classroom out of both practical and psychosocial concerns. As Ryan et al. (2001) have suggested, the physical environment and culture of the classroom are important. A large vacuous classroom, for example, may not be conducive to student questions but, even more significantly, the classroom culture (implicit and explicit norms, rules and requirements) may also inhibit or discourage a student from seeking help. Students may also believe that there is no point in asking for help if they hold a negative opinion of the instructor’s expertise or knowledge, or if they believe it will take too long to get the assistance they need (Ryan et al., 2001).

Even if a classroom environment is conducive to questions, students may still avoid seeking help out of a strong, possibly misplaced, desire for autonomy (‘I can do it myself’) or because they are reluctant to display a perceived weakness or lack of competence. Students may, for example, believe their peers or professor will view them as ‘dumb’ if they ask for help, especially if they view themselves as low achievers or less competent than their peers. Similarly, students who perceive themselves as less socially competent than their peers will also find it more challenging to seek help (Ryan and Pintrich, 1997; Ryan et al., 2001). Finally, student perceptions of instructor support (Karabenick and Sharma, 1994) play an important role in help-seeking behaviour, as do achievement and performance goals established by the instructor and the social/interpersonal climate of the classroom (Ryan et al., 2001).

There are, of course, very real practical reasons why people do not do things, but quite often these things can be a smokescreen for something else: deep concerns and threats which are felt, for example, in the face of taking on some new role. The problem, here, is often related to issues of self and self-identity. In order to act on new knowledge and skills, it may be that developing a new perspective is not sufficient. A student needs to develop a new self. This requires a deeper transformation of self.

Adult learning

Knowles (1978) originally coined the term ‘andragogy’ to describe a model of learning that he felt was distinctive of adults. He contrasted it with

Table 2.5 *Model of adult learning*

1. The learner's need to know	Why, what, how
2. The concept of the learner	Being self-directing Responsible for own learning
3. Prior experience of the learner	Being a rich resource for themselves and each other
4. Readiness to learn	Mental models Life-related Developmental task When they experience a need to know or do something in order to perform more effectively (can be encouraged)
5. Orientation to learning	Task or problem-centred
6. Motivation to learn	Internal, intrinsic Self-esteem Confidence Self-actualization Personal payoff

Source: Adapted from Knowles et al., 2005

'pedagogy' which he felt was more concerned with the learning of children. Updated in 2005, the main features of the *andragogical* model (see Table 2.5) focus on the concept of self as being responsible for one's own life, of being self-directed, a concept Knowles initially argued was characteristic of adults (as opposed to children). It attributes to adults a rich social and cultural reservoir of meaningful experience, a readiness to learn characterized by a real need to know and do; a life-centred, problem-centred and task-centred orientation to learning; and intrinsic, personal and emotional motivators such as confidence and self-esteem.

While andragogy was originally sharply contrasted with pedagogy, the two are better conceived as a continuum. The social context of the learning situation favours or hinders particular experience in such a way that some 'pedagogic' assumptions are more appropriate for adults and some andragogical assumptions more appropriate for children. Adult refers to a social age, rather than a biological age (Knowles et al., 2005). The marginalization of relevant experience might, for example, contribute to reducing the student's experience and moving him or her towards the 'pedagogical' end of the continuum. This is especially significant for higher education, because of the large number of younger students who are often poised – socially and biologically – between the two ends of the continuum. They can be particularly vulnerable to courses which, however unintentionally, 'demote' them, in the face of the superior knowledge, expertise and confidence of the teachers.

Andragogy does not, then, define a unique theory of learning with respect to 'adulthood', but it does raise important issues for teaching

practice (Merriam, 1993). This is especially so regarding the development of a 'self-directed' learning self, as opposed to a 'teacher-directed' learning self. To surmount this gap, quality of experience, volume of experience and even transformation of experience in the construction of knowledge are not sufficient. It is the role they play in the transformation of the person towards a critically self-directed and emancipated self that matters. To put into practice their understandings, actually to 'do', may require a critical reconstruction of self within the broader social, cultural and political situation. It must recognize the freedoms (Boud, 1989) that such a reconstruction requires (freedom in learning) and generates (freedom through learning). It encompasses 'conscientization' (Freire, 2000) or perspective 'transformation' (Mezirow, 1983). Mezirow describes an 'emancipatory process of becoming critically aware of how and why the structure of psycho-cultural assumptions has come to constrain the way we see ourselves and our relationships, reconstituting this structure to permit a more inclusive and discriminating integration of experience and acting upon these new understandings' (1983: 4).

The failure of doing, of actual concrete action, is often an issue of whether the student has constructed a learning self which is truly self-directing within the social overlap of his or her experience and the experiences of the learning situation. As we noted above, the experiential overlap is critically important and undermined by courses that ignore or marginalize student experience. The structure of the learning situation itself is also important, particularly the opportunities it affords the student to take responsibility and control of their learning and also of the methods, procedures and activities which structure the learning environment. Encouraging self-direction means not only sharing the social and cultural premises or meanings of the learning environment but also sharing control of the teaching and learning activities. This constitutes the nucleus of self-direction in learning: 'At the heart of self-directness is the adult's assumption of control over setting goals and generating personally meaningful evaluative criteria. One cannot be a self-directed learner if one is applying techniques of independent study within a context of goals determined by an external authority' (Brookfield, 1986: 19). Self-directed learning occurs when teaching and learning become the same thing, neither leading nor trailing one another. For Rogers this is closely associated with meta-learning:

the goal of education, if we are to survive, is the facilitation of change and learning. The only man who is educated is the man who has learned how to learn; the man who has learned how to adapt and change; the man who

has realised that no knowledge is secure, that only the process of seeking knowledge gives a basis for security (1969: 103).

The construction of such learning environments is, again, not easy, particularly for young students in the first years of their undergraduate studies. It may also be inappropriate to the learning situation and counterproductive to learning. But the development of self-directed students – students who have not only developed a deeper understanding of their subject and the abilities and skills to put it into practice, but also want to and actually do put them into practice – is one of the key challenges facing teachers in higher education.

It is not sufficient to encourage students to cross a limited number of these gaps. Teaching must provide the opportunity for all to be positively addressed. The tacit message at the centre of many learning environments is that if you follow the prescribed programme and methods and work hard you will be successful. But at what cost? Success may simply result in the construction of conformist and dependent selves and self-identities, identities that play an extremely important role in preventing us from doing what we want to do.

5. THE GAP BETWEEN ACTUALLY USING THE SKILLS/ABILITIES AND CHANGING

It appears odd to refer to this as a gap in which one position is change. As the above comment from Rogers illustrates, change has been a crucial theme in all the learning issues that we have been addressing in this chapter. What is meant here, however, is something more complex. If helping students to cross the other learning gaps has been a key process of change, crossing this gap is also a process of change, but it is a process to a position of *changing*, to a situation in which change is an ever-present and defining feature. This gap is concerned with the integration of continuous change as an intrinsic aspect of learning and practice, of being in the life-world, of supercomplexity. Students leaving college today will find the world they enter ‘to be one of ever-widening uncertainty, challenge and conflict, bearing on the three domains of knowledge, action and self. Criteria of truth, the will to act and the sense of one’s identity will be relentlessly tested and will be subject to continuing change’ (Barnett and Hallam, 1999: 149).

Yet, even this articulation is not fully sufficient to describe the ‘supercomplex’ condition for which we are preparing our students and ourselves. The

issue is not simply facilitating the capacity for change *over* time – and the reconstruction of knowledge, action and self which this entails – but also facilitating the capacity for change *within* simultaneous time. It requires the ability to operate with and switch between different synchronous perspectives and frames of thinking and action. Students need to develop the ability to make a series of ongoing commitments and challenges, as well as the ability to shift between them, to cope with change within the ‘synchronous’ demands of multiple perspectives. This condition of ‘changing’ requires capabilities for:

- the construction of multiple identities and selves which can be sustained simultaneously;
- the practice of these multiple frames of knowledge-action-self to critique one another;
- the management of this multiplicity and synchronicity of thought, action and being within the appropriate present and future situation; and
- the continuous integration, critique and development of this synchronous multiplicity in future learning.

The challenge is to construct a ‘curriculum of the future’ (Young, 1998) which is not simply for the future but of the future.

Being of the future, this curriculum must reflect in its vision, design and implementation the ‘uncertainty, unpredictability, contestability and challengeability’ (Barnett, 2000: 159) which the future, increasingly and more pervasively, injects into the present. It is this escalating overlap of the future with the present that defines the nature of the ‘supercomplex’ condition. Our teaching and pedagogical structures need to reflect this condition in our own understanding, the students’ understanding and the shared learning environment. Barnett describes such a new conception of higher education as having three key objectives: to create epistemological and ontological disturbance in the minds/beings of students; to enable students to live at ease with this perplexing and unsettling environment; and to enable them to make their own positive contributions to this supercomplex world (2000: 160).

The overall challenge for teaching and learning, which this fifth gap discloses, is to prepare our graduates for conditions mirroring the teacher’s own professional conditions. It is no less an important teaching challenge for being shared with our students. It means that ownership of the learning environment that we design and construct should not only be shared

with our students but with ourselves as well. As teachers with learning responsibilities (research, scholarship, professional practice, etc.) within a range of disciplinary and institutional structures and traditions this design must go further than the traditional teaching situation. It must, as we saw in Chapter 1, incorporate other academic practices and will include the ability to reframe one's teaching and learning within the multiple frames of research and service. Our own professional development as academics is, thus, implicit in our own teaching.

THE LEARNING SITUATION: STRUCTURES OF MEANING

The boundaries between many of the different theoretical perspectives on learning discussed in the above schema of learning gaps are not intended to be precise or definitive. Overlaps and vital inter-relationships abound. Many of the issues relating to the achievement of learning in one 'gap' are of central importance in others as well. Despite their different approaches, these theoretical perspectives provide a useful basis for reflection on the complex issues characterizing the achievement of student learning – issues which teaching can successfully address. As Laurillard suggests:

Students will not suddenly switch to being the model of holistic, deep and epistemologically sophisticated learners... Teaching must create a learning environment... at every level of description of the learning situation: i.e. conceptual structure, actions, feedback and goal must relate to each other so that integration can work (1993: 93).

In this section, we develop a model of the structure of meaning characterizing the teaching/learning context. It is intended as a conceptual 'tool' to assist practitioners to address the above learning 'gaps' while exploring their own teaching responsibilities and practices.

The above discussion touched on a wide range of pertinent issues and themes, but the central concepts throughout were 'meaning' and 'context': meaning constructed within the social context in which the learning encounter occurs. The key to traversing each gap is an active construction and integration of meaning in the social situation. Learning is not concerned with decoding and recalling information but rather with the process of social and practical understanding. It is an active and meaningful construction of facts, ideas, concepts, theories and experiences in order to work and manage successfully in a changing world of multiple and synchronous demands. It goes beyond the intellectual to encompass the personal, practical and social

dimensions of students' learning life. For all intents and purposes these dimensions refer to how students think, feel, act and interact in the world (Bain, 2004).

The multidimensional nature of learning is a product of the social context, its character, development and practice. It is also substantially shaped by the nature of the learning environment offered to the student. Even recognizing that the meaningful integration of learner, knowledge, assessment and community is central to successful learning environments (Bransford et al., 2000), the ways or modes of structuring those meanings are equally important. The modes of this learning environment – the methods and procedures by which the 'learning situation' exercises and realizes its meanings – have a significant role in assisting (or hindering) the student through the gaps described above. Such modes have sometimes been regarded as categories of strategy. Gibbs and Jenkins (1992) refer, for example, to 'control' and 'independence' strategies which teachers may take. These strategies or modes are closely related to the learning contexts from which they arise and which they help to create. Biggs (2003) refers to such contexts as climates and distinguishes between 'X and Y climates'. Teachers forming 'X' climates assume students 'need to be told what to do and what to study', whereas teachers operating in 'Y' climates 'assume students do their best work when given freedom and space to use their own judgements'. Teachers will generally operate with combinations of the two but individual teaching philosophies or conceptions may incline us towards one more than the other.

For the purposes of this discussion, we refer to three general modal contexts which structure learning environments: support, independence and interpersonal. In contexts described by support, *the principal modes of meaning* (e.g. course content, course objectives, teaching strategies, assessment methods, evaluation, etc.) and their implementation are primarily provided by and dependent on the teacher. The modes of meaning in independence contexts, on the other hand, are primarily given to the individual student to specify and perform independently. Finally, the interpersonal context and associated modes of structuring meaning are specified, developed and distributed among the students and with the teacher. Because these contexts inform the different kinds of meaning prevalent in the learning situation differently, we can relate them to the four dimensions of learning and meaning noted above – intellectual, personal, social and practical (see Figure 2.4).

It is not the intention of Figure 2.4 to suggest that certain contexts align more closely to specific dimensions but, rather, 1) that these contexts relate

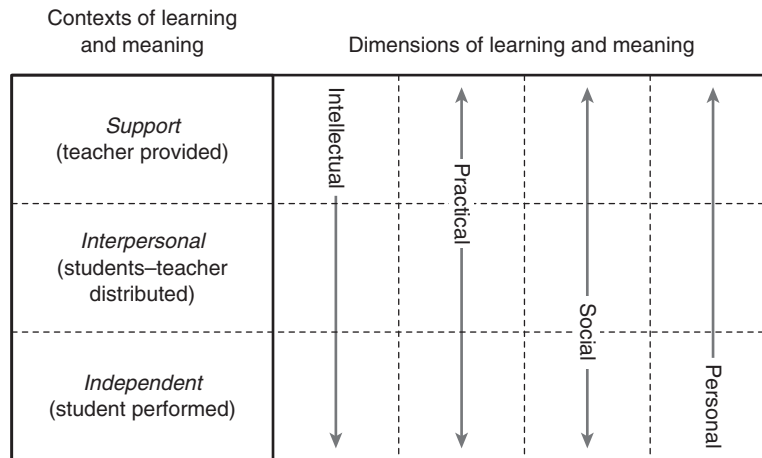


Figure 2.4 *Learning environments: a critical matrix*

to and subsume all four dimensions; and 2) that they are not mutually exclusive but may be usefully integrated within a given learning environment. In thinking about how to address the issues raised in the ‘gap’ schema, teachers might wish to think about the modal context(s) of meaning they will be using and the most appropriate dimension(s) to focus on, given the learning issues they want to address. There are an extensive range of options and possibilities and those that are the most appropriate will depend upon an array of variables. These will consist of the nature of the discipline, student numbers, student composition, academic background, degree level, and will include a variety of academic, institutional and even national constraints. There is no prescribed ‘right way’. Experience generally suggests that a balanced approach is the most effective. ‘Balanced’, of course, means different things to different professionals in different contexts.

None of the many theories considered here actually advocates a strong controlling environment. Such an environment might encourage a debilitating form of intellectual and personal dependency that would make crossing the individual ‘gaps’ difficult, and probably impossible. On the other hand, at certain points in the learning process, carefully controlled and managed environments may also be extremely supportive and encouraging. Indeed, the development of self-directed learning depends upon an element of risk-taking. An emotional context that is perceived as independent, cold and aloof may be personally threatening and one in which risks and the development of positive qualities of intellectual independence are avoided. While students might need support in discovering and locating the intellectual material and practical experiences from which they will learn – and are

to that degree dependent on teachers and the learning context – they do not need to be told how they should learn from those experiences. In certain situations, considered confusions, contradictions and discrepancies have also been effectively used to encourage students to examine their own assumptions and to make them more aware of habituated ways of perceiving, thinking, feeling and behaving.

CONCLUSIONS

This chapter has drawn upon a wide and diverse range of research on students and adult learning to explore both the potential learning gaps that challenge students in higher and professional education and to draw out the implications for the learning environments which teachers can construct to facilitate student learning. The critical matrix (Figure 2.4) provides a general structure for mapping existing learning environments and for creating new ones. The shape and balance between the various elements of the matrix which teachers will want to achieve in the environments they construct will vary enormously. At this stage, it is intended as an instrument for exploring and reflecting upon the general issues and problems about learning raised in this chapter. It will be extensively referred to in the next part of the book, providing teachers with a range of different ways for thinking about and achieving their teaching – specifically relating the elements of the matrix to the different aspects or genres of teaching practice.

Final questions: in so far as the learning matrix addresses the area between developing a professional language and the specific, concrete use of that language, it suggests a range of questions which teachers might like to consider as they approach the design and implementation of teaching. What can I do to promote learner-focused teaching in my courses? What does learning consist of in my course? Can I improve it? What dimensions of learning (intellectual, social, practical, personal) will be included? What kind of learning gaps might need to be addressed? What learning contexts are most appropriate to the learning environment I want to create? Reflections and ideas with respect to these kinds of questions can provide a substantive platform for engaging in the genres of teaching described in Part 2 of this book.