INVITATION TO THE READER

This is the seventh chapter of my book ‘Exploring Learning Ecologies’. I welcome constructive criticisms and suggestions for improving the content and readability and any additional or alternative perspectives that might be offered.

I would also be interested if anyone would like to try out the tools (Figure 7.6) to map their own curriculum to reveal the extent to which it affords students the opportunity to create their own ecologies for learning.

I am intending to complete the first draft of the book manuscript by December 1st 2015 so feedback before this date would be particularly helpful.

Please send your comments/suggestions to me at normanjackson@btinternet.com

Thank you very much for any assistance you can give me

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CHAPTER 7
A Learning Ecology Perspective on Curriculum, Pedagogy & Learning Environment

Curriculum

This chapter considers the way in which the idea of learning ecologies might be applied to a university's curriculum, its pedagogic practices and learning environment that underpin and support students' learning and their broader experience of being in a university.

In their book 'Engaging the Curriculum' (Barnett and Coate 2005:16) assert that 'curriculum goes to the heart of what we take higher education to be, of what might be and should be in the twenty first century'. This chapter and this book are trying to engage with the important question of what we take higher education to be, of what might be and should be in the decades to come, in the context of helping students develop themselves for their complex and unknowable future learning lives.

The word "curriculum" began as a Latin word meaning "the course of a race". By the nineteenth century, European universities routinely referred to their curriculum to describe both the complete course of study and particular courses and their content. How we define and perceive the curriculum has important consequences for how we approach the task of promoting students' learning and development, including the way they perceive their affordances for learning.

From an ecological perspective, one useful definition of a curriculum is 'the totality of student experiences that occur in the educational process' (Wiles 2008, Kelly 2009). From this perspective it is all a matter of whether the educational process is defined narrowly or expansively. At one end of the continuum a learner's educational process might be limited to that which is taught and learnt within a programme. At the other end of the continuum it includes all a student's experiences while they are studying at university - since most experiences have some potential for learning (Jackson 2011).

Smith (2000) considered the idea of curriculum from four perspectives:
- **Curriculum as content** - a syllabus or body of knowledge to be transmitted and learnt
- **Curriculum as product** - an attempt to achieve certain ends in students like the achievement of specified objectives. The outcomes model in higher education is a product-oriented curriculum
- **Curriculum as process** - curriculum results from the interaction of teachers, students and knowledge. It is what actually happens in the classroom and what people do to prepare and evaluate learning achieved.
- **Curriculum as praxis** - the process/activity by which a theory or skill is enacted, embodied or realised.

The last two conceptions have most relevance to the concept of a learning ecology.
In higher education the term curriculum is often perceived as being synonymous with the subject or subjects taught within a student's academic programme. There is thus a relationship between curriculum and the disciplines that form the basis for the academic organisation of a university. In fact, Berger (1970) emphasised the idea of discipline as curriculum in his definition of a discipline as 'a specific body of teachable knowledge with its own background of education, training, procedures, methods and content areas.'

Curriculum can also be visualised as an instrument or tool for delivering policy. Fotheringham et al (2012:2) visualised the curriculum as vehicle - to recognise the centrality of the curriculum as a fulcrum between high level policies and the students that these policies are intended to serve. Such a conception recognises the importance of curriculum, in the sense of both product and process, as the driving force supporting delivery of institutional policies and priorities. This concept would also be relevant to the idea of developing students' abilities to create self-determined learning ecologies if this became an institutional objective in the way personal development planning has for example.

**Academics' Conceptions of Curriculum**

In their study of curriculum in higher education Fraser and Bosanquet (2006:274) identified four ways in which academics think about curriculum:

1) the knowledge, learning and experience contained within a unit or module of study
2) the content and process of a programme of study comprising a variably prescribed set of study units or modules
3) the students' experience of learning: a process that is negotiated between learners and teachers and includes 'intended and unintended.....transactions' between a learner and a teacher
4) a collaborative partnership between learners and teachers that result in changes for both learners and teachers.

All these conceptions are based on an assumption that learners learn a curriculum, whether it is designed for them or negotiated with them.

In their study of creativity and curricula Edwards et al (2006) derived a similar set of perspectives on what faculty thought curriculum meant but also detected something that was much more emergent.

Use [of the term curriculum] varied widely, ranging from 'syllabus' and programme plans, to notions of the hidden curriculum, in which the social, cultural and political context (what some participants described as the 'fuzzier bits') was counted as part of what was taught. ... However, one conception of the curriculum emerged for understanding the broader possibilities for understanding creativity. This was the idea of the lived curriculum as experienced in the classroom. ... The lived curriculum arose dynamically out of [the teachers] interactions with students. (Edwards et al. 2006:60)

Oliver's (2002) interview-based study confirms that these are the ways that academics think about curriculum and also recognised that individuals hold multiple conceptions' of
Learning is 'the emergence in action of a new relational product growing out of the uniqueness of the individual on the one hand, and the materials, events, people, or circumstances of his life'. (adapted from Rogers 1961 - the word new has been substituted for novel)

curriculum which can be drawn upon in the same conversation. The following exemplify the variety of conceptions held:

- The absence of curriculum
- Curriculum as content map
- Curriculum as programme map
- Curriculum as process
- The hidden curriculum
- The lived curriculum

Whilst none of these should be viewed as the 'right' definition (they are all possible right answers depending on the way curriculum is being framed and used) it is interesting to note that some of the concepts presuppose others. With the exception of the absent and the lived curriculum, the definitions seem to become increasingly inclusive and holistic in terms of influences on teaching and learning.

The notion of the lived curriculum seems to represent a conceptual leap from conceptions that emphasise planning, designing, organising and instructing towards a conception of spontaneous performance, coping and being a part of a shared experience. It is a concept of emergence in which the experience of delivering changes what has been designed emerges dynamically out of interactions with students.

‘You’ve got to improvise - it's like a performance, in a way. One in which the audience can heckle and change the ending and stuff like that - you're not in complete control, and there’s no road map, and you just have to prepare as best you can and then cope’ (Oliver 2002 faculty interviewee).

Curriculum as Ecology for Learning

The idea that a curriculum is inhabited by people and brought to life through the interpretations and actions of the teacher and the responses of her students to those actions, in an environment that is structured and culturally attuned to encouraging and supporting learning is an ecological concept. It suggests also that learning itself is an emergent phenomenon: something that is only brought into being as a result of people participating and interacting in particular disciplinary and pedagogic contexts, working with the resources, tools and technologies that are available within the space it affords for learning, on the problems and inquiries that are relevant to the situation.

I have adapted Rogers’ (1961) definition of creativity to capture the idea that learning emerges from the circumstances of a learner’s life as a result of participating in a curriculum that has been brought to life by her teacher and enacted through her relationships with the teacher, her peers and the subject material and other resources in her learning environment. This way of
thinking about a learning inhabiting their learning environment is entirely consistent with the notion of an ecology for learning and we can relate the idea of curriculum to the conceptual framework for a learning ecology developed in chapter 2 (Figure 7.1).

Barab and Roth (2010) discussed the idea of curriculum-based ecosystems and suggested that the curriculum could be 'usefully arranged' around problematic situations with accompanying resources and tools rather than disciplinary content alone. The problem frames the learning situation (context) and gives meaning to content and purpose to the learning with which it is associated.

'curriculum-based ecosystems begin by setting up the problem and then making available various resources and suggested activities through which students assemble the necessary networks for solving the problem' (Barab and Roth 2010:9).

Using the model for a learning ecology used in chapters 2 - 6 (Figure 7.1) we can identify the components of a typical course-based learning ecology (Figure 7.2). A traditional face-to-face university course creates an ecology for learning that is designed, organised and implemented by an academic teacher who has both disciplinary and pedagogic expertise working within an institutional socio-cultural environment that is full of support and resources to aid learning. There is a structure (timetable/lecture schedule/credit structure) within which learning takes place determined by the institution and teacher. Programmes are organised into units or modules with explicit objectives, content, resources and processes that engage learners in activities through which they learn and some of their learning is assessed using one or more methods determined by teachers. There is a supportive infrastructure within the institutional environment and teachers and learners, and learners and learners interact in the institutional spaces, and resources, technologies and teaching strategies are used to facilitate interaction. The institutional-determined ecology for learning includes people - learners, teachers and others who help learners, a physical environment including classroom spaces, social spaces, resources centre and virtual spaces where learners and teachers interact for the purpose of learning.

Let us start by saying that higher education teachers as professional learners have the most wonderful opportunities to create ecologies for learning. They are employed to do so and the pedagogic expertise they develop supports this purpose. Not only that, they have abundant resources and infrastructures in the learning environment, to support the ecologies they create for student learning.
Figure 7.2 A typical course-based learning ecology created by a teacher for and with her students.

The ecology involves the teacher and her students immersed in a curriculum (usually subject-based) which is brought alive by the teacher’s pedagogic practices, enacted and supported within the university’s learning environment which is rich in places, spaces, resources, tools, technologies and professional support for learners and learning. The ecology is located in the present and emerging near future but it is connected to the past through the learning and capabilities gained in previous learning ecologies, and will be connected to future learning ecologies when they are brought into existence. It is very much part of the ‘flow’ which Barab and Roth (2006) consider is so important to the creation of meaning.

When educators fail to engage students in meaningful relations and instead impart core ideas as isolated facts or abstract concepts, these facts and concepts are no longer connected to the situations that allow them to be powerful tools in the world. The core disciplinary formalisms (facts, concepts, practices, methods, principles) run the likely risk of becoming disembodied and effectively disconnected from any meaningful use in the world. The irony is that we then wonder why [students] appear unmotivated to learn after we have disconnected meaning from the learning situation, assuming that the learner somehow will attribute the same functional value to the information as the teacher does. It is in response to this problem that we argue for an ecological view of learning and participation, one that allows content to live in its contextual richness with a focus on helping students attend to those underlying, invariant structures that also have cross-contextual value (Barab et al., 1999). In essence, we believe that “the place to look for meaningful content is not in the normal physical descriptors of individual particles [nor in the individual], but instead in the variables of the flow itself” (Swenson, 1999, p. 21). It is within this coupling of individual and environment, in the flow itself, that ecological psychologists locate meaning and intelligent action (Barab & Plucker, 2002) (Barab and Roth 2006:3-4).

Unfortunately, while teachers have huge affordances for the creation of ecologies for learning in which students participate as willing, or sometimes unwilling, partners, learners themselves may not have the same opportunities to create their own ecologies for learning. Their affordances depend on the way their programme has been designed and the way the teacher interprets and brings alive these designs. Depending on the underlying educational philosophy learners’ learning ecologies may be tightly controlled in terms of what is learned, how it is learned and when it is learned, and pedagogic activity
may be oriented towards transmission, guided discovery or self-directed learning. Furthermore, the teacher's pedagogic approaches may encourage independence or collaboration, or any blend of these possibilities. A learner's experience has to be viewed comprehensively and holistically in order to understand the nature of the learning ecologies that are being deployed.

**Pedagogy : bringing a curriculum to life**

A curriculum without a teacher's pedagogy is a lifeless thing. It's no more than a documentary specification that sets out the hopes and expectations of the curriculum designer, which may of may not be the teacher. So what is the skilled social practice that breathes life into written words? According to Smith (2012) the commonest view is that pedagogy is about teaching, and in the context of the academic curriculum it is about teaching a subject. In fact this view of pedagogy is essentially a didactic view, 'the concerns of didactics are: what should be taught and learnt (the content aspect); how to teach and learn (the aspects of transmitting and learning): to what purpose or intention something should he taught and learnt (the goal/aims aspect) (Künzli 1994 quoted in Gundem 2000: 236).

But there are, according to Smith (ibid), other dimensions of pedagogy that are highly relevant to the idea of learning ecologies, these include pedagogy as accompanying, caring for (and about), bringing learning to life and having a fundamental concern for enabling people to flourish. This shifts us away from learning as the transmission of knowledge into a much more social and relational view of a teacher with her students facilitating their learning and caring for them and their flourishing. A conception that is in keeping with the global challenge of helping students prepare for the complexities of their future lives.

This view is also consistent with Thomson et al (2012:8) who locate pedagogy in the highly situated social practices of the individual teacher and their social-cultural environment.

Pedagogy is more than teaching method, more than curriculum, more than assessment practice (Leach and Moon 2008). It is all these things, but it is also how they are made into patterns of actions, activities and interactions (Schatzki et al 2001) by a particular teacher, with a particular group of students [in a particular context]. The concept of pedagogy encompasses relationships, conversations, learning environments, rules, norms and culture within the wider social context (Facer 2011).

Thomson et al capture well the relational and ecological nature of being a teacher in the most profound sense of the word. Smith (2012) develops further the idea of pedagogy as *bringing learning to life* through:

- **Animation** - bringing 'life' into situations. This is often achieved through offering new experiences.
- **Reflection** - creating moments and spaces to explore lived experience
- **Action** - working with people so that they are able to make changes in their lives.
Animation. In their book *Working with experience: Animating learning* (Miller and Boud 1997) link 'animating' to 'learning' because of the word's connotations: to give life to, to quicken, to vivify, to inspire. They see the job of animators (animateurs) to be that of 'acting with learners, or with others, in situations where learning is an aspect of what is occurring, to assist them to work with their experience' (1997: 7). They work with people on situations and relationships so that they are more stimulating and satisfying. However, they also look to what Dewey (1916) described as 'enlarging experience and to making it more vivid and inspiring'. They encourage people to try new things and provide opportunities that open up fresh experiences.

Reflection. Conversation is central to the practice of informal educators and animators of community learning and development. With this has come a long tradition of working with the concerns and interests of those they are working with, while at the same time creating moments and spaces where people can come to know themselves, their situations and what is possible in their lives and communities.

Action. This isn't learning that stops at the classroom door, but is focused around working with people so that they can make changes in their lives - and in communities. As Lindeman put it many years ago, this is education as life. Based in responding to 'situations, not subjects' (1926: 4-7), it involves a committed and action-oriented form of education. In short, this is a process of joining in with people's lives and working with them to make informed and committed change.

McWilliam (2009) incorporates these ideas into her own caricatures of pedagogic practice suggesting that there are three basic pedagogic stances a teacher can adopt (Figure 7.3) which she calls, 'sage on the stage' (knowledge transmitter), 'guide on the side' (facilitator), and 'meddler-in-the-middle' (an involved co-learner/co-producer in the learning process).

![Figure 7.3](image)

Representations of teacher as 'sage on the stage', 'guide on the side' and 'meddler in the middle' (McWilliam 2009)

Each stance results in a different type of ecology for learning with different types and levels of affordance for student learners to form and pursue their own goals, define and create their own
process for learning and involvement in assessment, create/co-create their own content, and give and receive feedback to peers and teacher. Transmission models of teaching have far fewer affordances for students to create their own ecologies for learning than more facilitative or meddlin
g models of teacher involvement in bringing the curriculum to life to promote active forms of learning.

Active learning means that learners take more responsibility for and are actively engaged in their own learning rather than simply receiving and processing the information given to them by their teachers. Students must do more than just listen. They must read, inquire, question, discuss, write and be engaged in solving problems. In particular, students must engage in such higher-order thinking tasks as analysis, synthesis, and evaluation (Bonwell & Eison 1991). Of course the reality is that even in a lecture-based course students are or should be doing all of these things alongside the lectures they are attending.

But purposeful active learning in which activities have been conceived and implemented to deliberately engage learners in particular forms of activity for particular forms of learning engages students in two different ways - doing things and thinking about the things they are doing and have done, and the results of their doings (ibid 1991). In this way active learning strategies can be aligned to the self-regulatory model of learning (Zimmerman 2000 and chapter 5) that embraces the motivations to do something and the thinking about what needs to be done (forethought), the doing (performance) and then thinking about what has been done and achieved (reflection).

In active learning less emphasis is placed on information transmission and more emphasis is placed on developing student thinking and communication skills and the exploration of attitudes, values and beliefs. Student motivation is increased because of the interest, involvement personal and social way in which they are engaged. Furthermore, in active learning, students are able to receive immediate feedback from their teacher.

All teaching and learning techniques that seek to encourage and develop students’ as the creators of their own ecologies for learning must involve active learning and ideally should also embrace the triadic processes (forethought, performance and reflection) of self-regulatory model of learning (Zimmerman 2000 & chapter 5). The tasks and techniques used to promote active learning might be represented along two continua 1) from simple tasks on one end to complex tasks on the other and 2) from single independent tasks to multiple connected tasks that are well structured and deployed within a sustained strategy. It is the category of multiple connected tasks that offer the greatest affordance for students to develop their own ecologies for learning.

Learning Environment

Environment denotes the totality of the surroundings, conditions and circumstances in which something or someone lives and functions. In human ecosocial systems the environment includes the cultures within which people live and work. A learning environment consists of a wide variety of things that affect learning. We might start with a physical spaces such as classrooms, lecture theatres, computer rooms and specialist rooms where particular forms of social practice take place - like laboratories, dance
studios and music rehearsal rooms, and then move to libraries and learning resource centres and into social spaces such as cafe’s, bars, and even the outside public spaces where people meet and talk. To these we must add the virtual spaces that provide spaces for people to interact. Learning environments are planned but how they are used can only be planned up to a point.

The idea of a learning environment implies a setting where intentions and design cannot account for everything that happens; some elements escape control or are at least unintended. Environment, then, is a mix of the deliberate and the accidental, the conjunction of planned and unanticipated events. To some extent, traditional teaching in conventional classrooms could support this dynamic—students could be given assignments to take in directions that show mastery but also imagination and creativity. Now, however, with minimally mediated access to large amounts of information and with a substantially enhanced social dimension available to students, the set of directions students can take in their learning is far larger and growing. Some of this change is sanctioned by faculty; other parts of it reflect the environmental changes brought by technology and a tipping of control in favour of students regardless of faculty intentions (Warger and Dobbin 2009).

University learning environments have become richer with greater affordance for learning as computer-based and mobile communication technologies have grown, and people have become more familiar with inhabiting different virtual spaces. Indeed interest in understanding how student learners interact with their learning environment has emerged through these technological advances.

The infusion of information and communication technologies in teaching and learning is one of the primary drivers behind a conversation about learning environments, though many of the fundamental principles involved are equally valid in settings with little or no technology. Understanding the forces that affect learning can help educators implement environments that are appropriate for different situations, regardless of technology. That said, what makes a discussion of learning environments particularly important today is the range of opportunities that technology provides for creating new kinds of learning activities and experiences. The challenge is finding the right places for technology and using it wisely.

Space becomes environment when it is stretched to include a broader sense of place, as well as the people who participate and the culture in which these elements are situated. The idea of environment invites a wider range of participants: administrators of various levels and functions, faculty, guest experts, librarians, IT staff, instructional designers, and learning theorists and researchers. The term implies a multiplicity of players, forces, and systems interacting. Environment is dynamic—changing in response to influences from outside or arising inside. It recognizes complexity in causes and effects. (Warger and Dobbin 2009:6)

Many authors have used the idea of ecology/ecosystem to represent the interaction of people in their learning environment. For example, Hannafin and Hanafin (1996) used the idea of ecology/ecosystem to embrace the complexity, interactivity and interdependency of the functions, activities, structures, resources and people that are involved in a university’s learning enterprise and learning environment.

Learning environments operate as ecosystems. Individual elements must function autonomously as well as interactively..... In learning environments, learners as well as facilitators observe, measure, test, listen and probe to assess the integrity and effectiveness of the environment [to
support learning] and make needed changes. This may require the learner and facilitator to examine and adjust strategies, technologies or learning activities to achieve balance. It requires active teaching and learning to develop understandings of how each element, as well as the overall system is functioning. Ecosystems are judged successful when they promote equilibrium among their components and interact in ways that support their functions (Hannafin and Hannafin 1996:52-3).

More recently, Ellis and Goodyear (2010) positioned their examination of students' experiences of e-learning in the context of 'the broader ecology of learning and teaching' that a university supports. They develop a compelling narrative for viewing the university as a large complex ecosystem involving the relationships and interactions of all the inhabitants - students, teachers, researchers, support and administrative staff, managers and leaders, and their connections with employers and society more generally, the resources, physical spaces and virtual environments, processes and practices that are played out day to day. They used the term, 'ecology of learning' to represent the educational practices and learning activities that promote students' learning stating, 'we feel it best represents the nature of the phenomenon which has students at its centre, and includes all legitimate stakeholders including teachers, university service providers and university leaders.' (Ellis and Goodyear 2010:51). From a whole university system perspective the key aspects of an ecology of learning (ibid 20) are: maintenance of an ecological balance; the development of self-awareness of how the parts of the ecology are related to the whole; the ongoing pursuit of feedback to inform self-awareness and the capacity of self-correction (agility) required to ensure (re)alignment in a rapidly changing world.

Maintaining an ecological balance on learning requires all the parts of the university to act in ways that demonstrate self-awareness of their function and purpose in relation to the mission of the institution. In order for the parts of the university to understand how they [its component parts] are functioning, in relation to the work and purpose of the whole, they need to engage in systematic processes of collecting feedback from stakeholders about the effectiveness of their operations. Ellis and Goodyear (2010:30)

These perspectives on the university as a complex ecosystem, part of which supports the learning and development of its students and teachers, provides a platform on which to examine in more detail how the idea of ecologies for learning might be interpreted at the level of curriculum, teaching and learning practices.

**Lifewide Curriculum Paradigm**

What if higher education whole heartedly embraced the idea of learning ecologies? What would be the most appropriate curriculum paradigm to optimise the affordances for students to experience and be aware of their own ecologies for learning? As we saw earlier, there are many conceptions of curriculum and the way it is defined determines the nature and extent of affordances for student learners to create their own ecologies for learning, developing and achieving.

For the purpose of exploring the what if question I will adopt the most expansive concept of a higher education curriculum that I can think of namely a lifewide curriculum which
includes all a student's experiences while they are studying at university - since most experiences have some potential for learning (Jackson 2011). In fact, the recent expansion of co- and extra-curricular award schemes (Jackson and Willis 2014) mans that many universities in the UK are implicitly adopting a lifewide curriculum although they will not use this term to represent what they are doing. Such schemes enable a learner to incorporate and integrate their learning from any aspect of their life into their higher education experience.

The concrete expression of a lifewide undergraduate curriculum is depicted in Figure 7.5. It contains four different curricular domains:

1. academic curriculum, which may by design integrate real-world work or community-based experiences;
2. work-related curriculum which is linked to a programme but does not receive academic credit;
3. co-curriculum: experiences provided by the university that may or may not be credit-bearing and for which learners may or may not receive formal recognition;
4. extra-curriculum: experiences that are determined by the learners themselves and constitute all the spaces that they inhabit outside the other domains.

The distinction between co- and extra-curricular has been deliberately blurred in some universities as experiences that would be considered to be extra-curricular in Figure 6.5 have been incorporated into the co-curriculum. These curricular domains, and their potential to encourage and support students' creative development, are described below.

Figure 7.5 A lifewide curriculum (Jackson 2011, 2014)
Academic curriculum

The academic curriculum is predominantly focused on learning about a subject with heavy reliance on explicit or codified knowledge mediated by teachers who embody an epistemology of practice that is appropriate to 'being an academic in a particular disciplinary field'. Experiences in the academic curriculum tend towards mastering theory-rich knowledge through transmission, self-study and sometimes small group study.

All subjects taught in universities adopt the lecture as the most efficient teaching vehicle for a transmitting information but it is the poorest vehicle for enabling learners to develop their knowing. Barab and Roth (2006) are critical of pedagogies that do not permit learners to understand through situating their learning in a context of purposeful and relevant activity. Fortunately, teachers in all disciplines employ a wide range of strategies to engage students in more active forms of learning. Approaches to learning that encourage learners to form their own or group ecologies for learning include project-based, problem-based, inquiry-based, context-based - work / community / field -based, designing-making, enterprise-led, game-play/role-play, student-organised seminars, conferences and exhibitions, participation in competitions contract-based learning where goals and outcomes are negotiated.

One of the issues with less active forms of learning which stresses the conceptual and theoretical at the expense of practical know how used to solve real world problems, is the way it decontextualises knowledge. This forces students to memorize facts that seem to them irrelevant, mundane and boring details before allowing them to see the beauty and excitement, relevance and intrinsic value in the subject. Diaz (2013) suggests that one way of improving the relevance of a subject-based curriculum is to begin the exploration of ideas with the explanation of why those ideas are important and relevant to learners' lives. In other words we 'flip the curriculum' Figure 7.6.

Figure 7.6 Patterns of learning in a normal and inverted (flipped) curriculum

He tells the story of how, as a 10 year old boy, he became fascinated by Formula One racing cars and it inspired him to study engineering. As an undergraduate studying Engineering he found himself leading a team to build a racing car and he immersed himself in equations that enabled him to understand the dynamics of the performance of the vehicle. He spent night after night grappling with the mathematics but it felt exciting and the purpose of this deep involvement was realised in the making and the creation of his race car. He argues that he would never have wanted to learn and master the difficult equations if he had been made to memorise them without appreciating their purpose, meaning and practical significance. In other words, he was able to contextualise the mathematical details in the purpose and relevance of his own real world
problem. His learning was driven by the deep intrinsic motivation of designing, building and racing his car: of turning a vision into a design and then a reality. In effect he created, with his team, an ecology for learning in order to achieve something they valued.

The wisdom in this story is that this is the way we learn in life outside the world of formal education. We find things we are interested in or need to know about and then work out how to gain a deeper understanding. Our interests, passions and needs are stimulated by the relevance of the problem and our imagined solutions. Our interests and related beliefs provide us with the purpose that makes us want to learn more. We begin with the problem, the opportunity or the vision, we work out some ways of finding out more before we get into the detail of solving the problem and finding a solution. In such circumstances intrinsic motivational forces become so strong that we are driven to creating an ecology for learning because we want to achieve something that we value. In Diaz’s view the solution to making formal education more relevant, exciting and meaningful is to invert the curriculum - inspire with big relevant ideas before immersing learners in the detail. But more significantly he is also saying that we need to provide the contexts in which learners are inspired to create their own ecologies for learning to solve the problems that they are motivated to achieve because they are relevant, meaningful and significant to them.

**Signature pedagogies**

Signature pedagogies (Schulman 2005a and b) create ecologies for learning that are relevant in particular disciplines and curricular contexts. They are the modes of teaching and learning, used in the preparation of people for a particular profession such as law, medicine, teaching or being an architect, engineer or geologist. They provide the pathway to admission into the practices of the profession and involve not just learning to think academically within the disciplinary field but also to think and behave as a professional practitioner would.

The educator in a profession is teaching someone to understand in order to act, to act in order to make a difference in the minds and lives of others-- to act in order to serve others responsibly and with integrity.…..professional education is a synthesis of three apprenticeships--a cognitive apprenticeship wherein one learns to think like a professional, a practical apprenticeship where one learns to perform like a professional, and a moral apprenticeship where one learns to think and act in a responsible and ethical manner that integrates across all three domains (Schulman 2005a).

Signature pedagogies are heavily routinised and systematic. There is little room for novelty in the approach to a case. Learning is undertaken in social practice contexts, for example - studios, laboratories, workshops, real world environments like the field, a hospital or other professional work situations. Such settings provide experiences that are more unstructured, informal and unpredictable and learners have to be able to assess situations, formulate strategies to deal with them and monitor and adjust their own performance in dealing with them ie engage in professional self-regulated learning.
Work/practice curriculum

In the work environment the emphasis is on tacit knowledge that is embodied in the conversations and relevant social practices of the people who are involved in work. In the work environment learning and development are a by-product of performing and accomplishing a task or project rather than being the focus for the task.

The practice-curriculum replaces the largely theoretical thinking experience of the classroom with the emotionally turbulent, real time, experiential - performing, problem solving, and producing situational environment of work. It involves learning through doing in dynamic contexts, and sometimes not succeeding so that learning through mistakes is important. It involves working alongside and observing people who are already expert and tapping into their tacit embodied knowledge.

The role of the educator is to: a) prepare learners for their experience and support them through it, b) encourage reflection and support this process through tools and strategies that will enable learners to think deeply and systematically about their experience drawing maximum benefit from it and c) help learners recognise their complex learning achievements, and value their self-evaluations of their informal learning including.

Participating in the practice curriculum enables learners to learn and be inducted into an epistemology of social practice which is fundamental to being able to build ecologies for learning and achievement in the particular work environment. The epistemology of (professional) work practice (coming to know what to do through working in specific situations drawing on past experiences which includes learned theory) can only be learned through the experience of practising with other practitioners. The epistemology of practice pays particular attention to the idea of Legitimate Peripheral Participation (Lave and Wenger, 1991). It is situations of social practice that learners come to know what it means to be creative in the organisational and professional cultures of a particular work environment.

Raelin (2007) identifies the building blocks of an epistemology of practice as:

- **Extensive use of tacit knowledge** - the tacit processes that practitioners use as they work through the problems and challenges of daily practice. Such knowledge is deeply rooted in action and involvement in a specific context in a specific time. But while people may be knowledgeable about what they do and can do it, they may not be able to explain how they know what to do.

- **Critical reflection** - the thinking capacity to make sense of their own practice and experiences and mindful habit of doing it. Or the ability to think about how their actions resulted in a particular outcome. This ability results in the creation of a personal ‘real time’ learning environment through which beliefs, assumptions and mental models as well as actions, can be tested and evaluated.

- **Mastery** - people develop their expertise not only by repeated practice in a single domain but by acquiring skills in multiple contexts. Mastery is developed through an
appropriate apprenticeship in which novice practitioners are exposed to embodied practice, apply and develop their own practice, are encouraged and given feedback on their performance and gradually take on more and more responsibility. Developing mastery is coupled to the development of tacit knowledge and knowing, and the ability to evaluate and learn from own experiences through critical reflection.

Eraut (2007 and 2009) notes that the basic epistemology of practice involves the professional actions of:

- **Assessing situations** (sometimes briefly, sometimes involving a long process of *investigation and enquiry*) and continuing to monitor the situation;
- **Deciding what, if any, action to take**, both immediately and over a longer period (either on one's own or as a leader or member of a team);
- **Pursuing an agreed course of action**, performing professional actions - modifying, consulting, evaluating and reassessing as and when necessary;
- **Metacognitive monitoring of oneself**, people needing attention and the general progress of the case, problem, project or situation; and sometimes also learning through reflection on the experience.

They are the essential processes that underlie self-regulation (chapter 5) and the key processes necessary to building and maintaining an ecology for learning, developing and achieving. Consequently, the work/social practice environment offers learners significant affordance for not only developing and applying their self-regulatory skills and behaviours, but also to develop and implement their own ecologies for learning.

**Co-curriculum**

The co- (complementary) curriculum, is not part of the formal academic or practice curriculum. It contains experiences or opportunities provided by the university that may or may not be credit-bearing and for which learners may or may not receive formal recognition. The co-curriculum may contain opportunities for learning particular skills which are essentially taught and where a competent authority determines what will be learnt and how it will be learnt. But the co-curriculum is also likely to contain opportunities for learning in unstructured situations where learners participate in social practice in community organisations or employment settings outside the university, or perhaps involve themselves in an enterprise activity like creating a business, organising an event or entering a competition. In these situations learners, often working collaboratively, are more able to determine their own goals and purposes, knowledge and skill content, processes, resources, tools and technologies and outcomes/achievements.

A distinctive feature of co-curricular activities is their potential for incorporating diversity (learners from all levels, all disciplines and all cultural backgrounds) into the experience and for learners themselves to take a more direct role in shaping, co-creating and facilitating the experience. Such opportunities provide considerable opportunity for engaging in social practice and even creating such practice, and for creative self-expression. The role of the professional educator here is to ensure that learners are aware of these things and that self-evaluation processes designed into the experience
draw attention to these forms of learning and creativity. The co-curricular environment offers learners significant affordance to develop and implement their own ecologies for learning often in partnership with their peers and facilitators.

**Extra-curriculum**

The extra-curriculum domain comprises all the experiences that are determined by the learner themselves and constitute all the spaces that they inhabit outside the other curricular domains. We don’t normally consider this domain in higher education yet it is sometimes the largest and often the most creative part of a learners life. It is rich in experiences that involve complex relationships and social interactions with family and friends, sustained activities that are grown from need - like having to earn an income to support study, activities that are pursued for their intrinsic interest and challenges - like sport, hobbies, membership of societies, drama groups, religious affiliations, and looking after yourself as an independent adult. All these things need to be incorporated into a busy life. Space needs to be found and lives have to be organised to enable things to happen while retaining the ability to improvise when faced with the unexpected.

The extra-curricular domain is rich in novel experiences since this is where people experiment and try out entirely new experiences. For example, travel may put a learner into a culture very different to their own, or serious illness or loss of a close friend or relative may push people into emotional spaces that have never been encountered before and stand out as significant events in a learners life. There is much informal and complex learning embedded in many of these situations which could be recognised as part of the personal growth of the individual.

In the extra-curricular domain learners choose their own contexts for participation and spending their time motivated by their own interests, purposes and beliefs. The unstructured and sometimes chaotic nature of experience provides great affordance for learners themselves to determine their own goals, plan and execute their own strategies, develop and apply their capability to deal with particular situations, identify, use and create resources, use their own tools and technologies, monitor and judge their own performance and what they have achieved. Because of these characteristics it offers the greatest affordance for students to build their own ecologies for learning, developing and achieving.

**Learning Ecologies and Lifewide Education**

From the above we can see that learning ecologies are a feature of both formal educational settings, where the ecology is largely determined by teachers and the institution, and informal learning settings, like work and other social practice spaces, where ecologies are largely determined by individuals and groups without the mediation of people whose business is the education or development of students. Jackson (2014) provides a framework (Figure 7.7) to help visualise the relationship between individuals' learning ecologies and educational practices that support and recognise the outcomes of learning from such ecologies.
The 2x2 matrix is defined by the 1) contexts for learning i.e. whether the contexts are formally constituted and structured within an academic programme or whether they are informal and unstructured opportunities for learning and development, and whether the 2) institution or the learner determines the what and why, the how, where and the when of learning, and ultimately what counts as learning. Put another way, who determines the goals and purposes, knowledge and skill content, processes, resources, tools and technologies and outcomes/achievements.

Figure 7.7 Conceptual tool for evaluating the affordances within a lifewide curriculum for students to determine and create their own ecologies for learning (D>B/C>A). The Goals+++ axis contains the dimensions of goals and purposes, intended learning, knowledge and skill content, process, resources including tools and technologies, relationships and recognition of achievement.

Four different learning scenarios are imagined to represent the different conceptual spaces in Figure 7.7.

**A) Traditional lecture-based ecology for learning**

Teachers working with a pre-determined curriculum or syllabus containing specific knowledge and opportunities for skill development and supported by an appropriate set of resources, engage their students in a process for learning. The main activities undertaken by learners are attendance at lectures, perhaps supplemented by seminars, essay-based coursework assignments, and revision for examinations. Learning and achievement reflect mastering the content of the course, determined through teacher assessment. In this type of learning ecology the learner has little or no involvement in the design of the ecology they merely participate in one that has been designed for them. They have little or no control over such things as goals, tasks, content, process, resources and what counts as
learning and achievement. Their learning is likely to be geared to gaining the best grades in their coursework and examinations.

**B) Active learning eg enquiry, problem, project- learning ecologies**

Pedagogies that lead to extended processes for learning and contexts within which particular forms of learning are situated will engage learners in very different forms of participatory activity. Problem-, project-, inquiry-, event-, design and make, and field-based learning all actively encourage learners to define and explore their own problems, build and utilise relationships for learning, be resourceful and discover for themselves the knowledge they need to produce possible solutions, sometimes in contexts that are unfamiliar. In these types of learning contexts teachers operate as facilitators, guides, supervisors and coaches rather than didactic transmitters. Such pedagogies and practices help learners develop the will, capability and confidence to create their own learning ecologies for learning and achieving. Students will still want to gain good grades in their coursework and examinations, but in engaging in these sorts of processes they are gaining much more. They are learning through an experience that learning involves a process that has to be created. That involves assessing a situation, defining problems and seeing opportunities, setting goals, planning and executing tasks, discovering and applying relevant knowledge and other resources and forming new relationships. Although ultimately the teacher will determined what counts as learning and achievement and they may give little or no recognition for learners' processes of learning, learners will still have learned these things. Learning that is important to the creation a learning ecology.

**C) Self-directed but institutionally supported learning ecologies**

There are some contexts in unstructured environments like for example work, volunteering in the community, independent fieldwork, co-curricular enterprise and event organising, which involve learners in activity in which they determining for themselves goals, tasks, content, process and resources. Such environments are beyond the control of the teacher and institution but they may be influenced and supervised by other people like employers, supervisors, entrepreneurs, who may influence goals, tasks, content, process, relationships and resources, and ultimately the recognition of what counts as learning, performance and achievement. Universities can capitalise on these contexts for students' development through frameworks and processes that enable learners to visualise, plan, record/evidence, reflect on, make claims and gain recognition for their own learning and development. These forms of support and recognition vary in the extent to which they focus learners' attention on specific goals and outcomes or they encourage learners to define their own goals and achievements. Support may also be given to encourage and facilitate interaction between learners engaged in a similar process for example in providing a forum for students to exchange information and discuss situations.

**D) Independent self-directed learning ecologies**

This conceptual space is where people create their own learning ecologies for their own purposes typically for their own learning projects often associated with interests like sport, hobbies, travel, working in the community or for a charity, enterprise like setting up a
business or organising an event, raising a child and countless more contexts. Involvement and learning are not driven by the need or desire for formal recognition but by the intrinsic desire to improve self, and the sense of doing something worthwhile to contribute and make a positive difference. In such self-motivated circumstances the learner determines for themselves and or with co-participants goals, tasks, content, process, resources and relationships and achievements. Although, learners do not seek recognition for learning and personal development gained through such experiences a university could provide the planning and reflective tools and mechanisms that enable learners to plan, record/evidence, reflect on, make claims and gain recognition for their own learning and development. From an educational perspective these contexts are particularly favourable for learners developing their own ecologies for learning and achievement in a way that a formally structured and controlled educational environment cannot.

The value of an ecological perspective

The ecological perspective brings together in a holistic way all the elements of a student's experience for learning, developing and achieving that make sense to him. From his perspective the things that really matter and have made a significant difference to him are not only the things that the university has done. Often, the things that matter to him will also include things that he has done by and for himself often with his peers. They matter because he has been able, through his own agency and muddlings, to make them happen. He has been able to take responsibility for making something happen: something that might have challenged and scared him through which he gained a real sense of accomplishment. Ultimately we are not talking about simple achievements like passing a test or even exam - he has spent much of his life doing this. Rather we are talking about doing something difficult he has never done before and proving to himself that he can do it and do it well. And an important part of that sense of achievement derives from the messy journey he has made to work things out for himself.

An educational institution may support learners' creating their own learning ecologies in some or all of the spaces outlined in figure 7.7. But all too often the bulk of a student's higher education learning experience is located in the space of academic routine (space A) where there is little or no scope for creating their own ecology for learning.

However, even when an academic programme is not designed to encourage learners to create their own ecologies for learning, and perhaps because of this! some learners are motivated to create their own learning ecologies. These enrich their formal experience through informal learning experiences that enable them to become the scientist, lawyer, geologist, engineer or any other discipline-based practitioner they want to be.

Chapters 3, 4, 5 and 6, contain numerous stories of students and teachers who have put themselves into situations that challenge them and have done things by themselves, or with their peers, in order to develop themselves to serve an interest, need or ambition

In chapter 3 Michael told his story of the things he did to try and develop himself to become the archaeologist he wanted to become. Using the map of his ecology for learning and developing himself while he was at university we can appreciate the affordances he
perceived and accessed to imagine and determine, sometimes with co-participants - goals, tasks and activities, content, process, resources, relationships and achievements. Figure 6.8 provides a visual representation of his doings. The outer boundary encloses the things he said contributed to his sense of being an archaeologist and the way he developed his knowledge, skills, values, beliefs and confidence in being an archaeologist - his ecology for learning and personal development. The letters ABCD relate to the affordances in a particular context/activity for determining his own goals, tasks and activities, content, process, resources, relationships and achievements. It is clear that although his academic programme provided some affordances for him to determine his own ecologies for learning and achieving. The projects he undertook or created for himself outside his course provided him with the greatest affordance for self-determined learning and achievement.

Figure 7.8 Mapping a student's ecology for learning and personal development. See Michael's narrative (chapter 3) describing how he learnt to become the archaeologist he wanted to be. His ecology for learning includes his BSc programme and many other activities that were outside his course. The letters ABCD relate to the affordances in a particular situation for determining his own goals, tasks and activities, content, process, resources, relationships and achievements. They reflect the degree to which is able to create his own ecologies for learning.

This simple mapping device could be used to help learners reflect on, make sense of and appreciate their own learning and development. It shows them that what they do outside their programme to develop themselves is as important as what they do within their programme. It tells them that they, not the university, control their own ecology for learning, developing and achieving.
Mapping the curriculum - possible institutional case study

It would be very instructive to include an example to illustrate the way a curriculum could be mapped to show the affordances for self-determined, self-directed, self-regulated learning i.e. affordances for learners to create their own ecologies for learning and achieving using the Figure 6.6 conceptual tool. This would also reveal the particular disciplinary contexts and active learning strategies being used.

**The way it might work (please adapt)**

Using a large scale curriculum map showing units/modules at each level, programme specifications and module descriptors.

For each module/unit consider

1) Context - institution, field, work, community other

2) Mix of learning activities - lectures, practicals, seminars, other

Approaches to learning that encourage learners to form their own or group ecologies for learning include project-based, problem-based, inquiry-based, context-based - work / community / field - based, designing-making, enterprise-led, game-play/role-play, student-organised seminars, conferences and exhibitions, participation in competitions contract-based learning where goals and outcomes are negotiated.

3) Opportunities for learners to engage in self-directed, self-determined and self-regulated learning - are students involved in some form of planning and reflective process?

4) Opportunities learners have to determine for themselves and or with co-participants goals, tasks/activities, processes, knowledge content, other resources and relationships and outcomes.

4) Assessment - what assessment tools/strategies are used what sorts of things are they trying to assess?

**MAKE A JUDGEMENT AS TO WHICH FIELD THE MODULE SITS A,B,C,D?**

Conceptual tool for evaluating the affordances within a lifelong curriculum for students to determine and create their own ecologies for learning (D>B/C>A).

The Goals++++ axis contains the dimensions of goals and purposes, intended learning, knowledge and skill content, process, resources including tools and technologies, relationships and recognition of achievement.