

CHAPTER A5

The Concept of Learning Ecologies

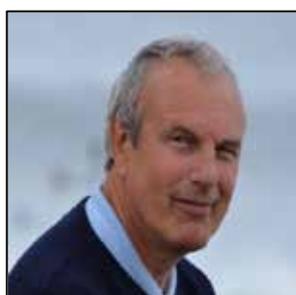
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SUMMARY

The ecological metaphor has been applied to many contexts and is well suited to human interactions between people and their environment, their processes for doing, learning and achieving, and for developing new knowledge in unstructured contexts. This chapter examines the conceptual basis for learning ecologies and considers the value of the idea for lifewide learning and education. An individual's learning ecology comprises their process and set of contexts, relationships and interactions that provides opportunities and resources for learning, development and achievement. Learning ecologies have temporal dimensions as well as spatial dimensions and they have the capability to connect different spaces and contexts existing simultaneously across a person's life-course, as well as different spaces and contexts existing through time throughout their life-course.

Knowing how to create and sustain a learning ecology is an essential part of 'knowing how to learn' in all the different contexts that comprise an individual's life. Self-created learning ecologies are the means by which experiences and learning are connected and integrated across the contexts and situations that constitute a person's life. Learning ecologies are therefore of significant conceptual and practical value to the theory and practice of lifewide learning and education. It might be expected that an institution adopting a lifewide education approach to learning and personal development would not only pay attention to the role of learning ecologies but also enable learners to understand and create their own learning ecologies.

BIOGRAPHY



Norman Jackson is Emeritus Professor at the University of Surrey, Fellow of the Royal Society of Arts and Founder of the Lifewide Education Community. Between 2005-11 he was Director of the Surrey Centre for Excellence in Professional Training and Education (SCEPTre) which developed and implemented the idea of lifewide learning and education in a university environment. With other members of the Lifewide Education community he continues to explore the dimensions of lifewide learning and education to advance understanding and encourage the spread of practice.

INTRODUCTION

The terms 'ecologies' or 'eco-systems' are used to describe the dynamic interactions between plants, animals and micro-organisms and their environment, working together as a functional unit. Ecologies are *living systems* containing a diversity of factors that interact with each other that are self-organising, adaptive and fragile.

An ecosystem is^A

- a habitat in which individuals of various species co-exist in relative stability and inter-dependence
- a set of overlapping but distinct territories and niches, each with its own rules, affordances and constraints
- a self-regulating system that consumes and recycles resources
- an organisation in which change occurs over time, modifying individuals, species and inter-relations, without destroying the overall cohesion and balance.

The ecological metaphor has been applied to many contexts and is well suited to human interactions. In human ecosystems the ecological perspective views people in their physical, social and virtual environments as a unitary system living within a particular cultural and historic context consuming, recycling and producing resources, including information and knowledge, and changing (learning and developing) through the process of interaction (Germain and Gitterman 1994)

An individual's learning ecology comprises their process and set of contexts and interactions that provides them with opportunities and resources for learning, development and achievement. Each context comprises a unique configuration of purposes, activities, material resources, relationships and the interactions and mediated learning that emerge from them. This chapter examines the idea of a learning ecology conceptually and considers their relevance for lifewide learning and education. It addresses the question of 'what is a learning ecology' drawing on a range of perspectives gleaned from the literature. A number of conceptual aids are offered to help appreciate the nature of learning ecologies. Consideration is given to learning ecologies in educational and non-educational settings. The final part offers some reasons for why the idea of learning ecologies is important for lifewide learning and education, and the future of learning and education more generally. A companion chapter (Jackson in press) provides illustrative narratives of self-created learning ecologies.

CONCEPT

Space

Siemens (2007:63) defined a learning ecology as *'the space in which learning occurs'*. The characteristics of an ecology determine what can exist within it and learning ecologies are structured to serve a particular aim or purpose. According to Siemens (ibid 62-3) learning ecologies are:

- Adaptive, dynamic and responsive - the ecology enables (or more specifically fosters) adaptation to the needs of the agents within the space.



- Chaotic - diversity generates chaos which is created in dynamic environments and systems
- Self-organising and individually directed - organisation occurs through the ongoing interactions of elements within the ecology
- Alive - features continual changes, newness, activity
- Diverse - with multiple viewpoints and nodes (often contradictory) exist.
- Structured informality - structure enables ongoing diversity of openness not restricting development. Minimal control is required to function but no more
- Emerging - the space itself is evolving and adaptive.

Contexts

Barron (2006) applied the idea of personal learning ecologies in her study of how young people developed their digital literacies, discovering that individuals developed their digital fluency through many different activities in many different places inside and outside school. Her definition of a learning ecology enriches Siemens limited concept of ecology as a space by emphasising what happens in that space, *'the set of contexts found in physical or virtual spaces that provide opportunities for learning. Each context is comprised of a unique configuration of activities, material resources, relationships and the interactions that emerge from them'* (Barron 2006: 195).

Personal learning ecologies are created within social environments and contexts. In such ecosocial systems the social-cultural arrangement of practices and artefacts and the ecosystem of environmental processes are treated as a single unified system, and the semiotic practices are also regarded as being material processes. The meanings they generate play an essential role in the overall dynamics of the system (Lemke 1997).

What is so special about ecosocial systems among all other possible ecosystems is not that they contain us and our things, but that our behavior within the system, and so the overall dynamics of the system as a whole, depends not just on the principles that govern the flow of matter and energy in all ecosystems, but also on what those flows mean for us (Lemke 1997:40).

Processes

Lemke (2000) argues that social ecologies cannot be defined simply by the spaces they occupy: they must also be defined in terms of their processes - an ecosocial system is a system of interdependent processes within which relationships are developed and enacted.

In dynamical theories of complex systems, the fundamental unit of analysis is a process... It is in relation to the process that its participants are defined, as filling roles in that process. *Things*, or *organisms*, or *persons*, or *institutions*, as usually defined, are not dynamical notions: they are ordinarily defined in terms of their stable and persistent, or invariant, properties. They are not about dynamics, not about change and doing, but about being what they are. Every process, action, social practice, or activity occurs on some timescale (in complex cases on more than one timescale). In a dynamical theory, an

ecosocial system is a system of interdependent processes; an ecosocial or sociotechnical network is described by saying what's going on, what's participating and how, and how one going-on is interdependent with another (Lemke 2000: 275).

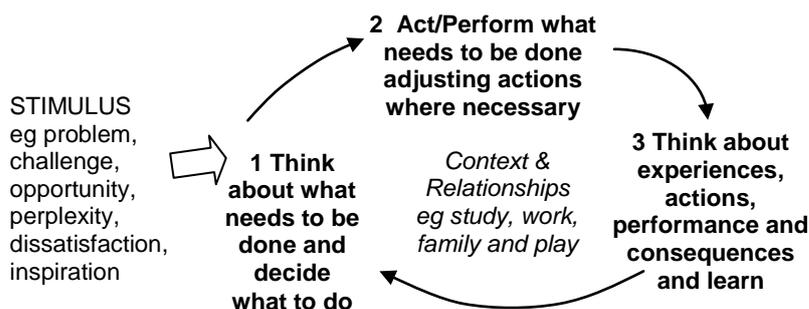
Networks of affordances

In developing an ecological perspective on knowing Barab and Roth (2006) describe the environment in terms of affordance networks which are extended in time and space and can include perceptual and cognitive affordances that collectively form the network for particular goal sets. Affordance networks are functionally bound in terms of facts, concepts, tools methods, practices, commitments and people that can be enlisted towards the satisfaction of a particular goal (ibid 4). Affordance networks are not passive potentials they also have intention, in that individuals or groups intentionally create them in order to achieve their goals. However, while an affordance network may be specified in an environment, it is available and only of interest to certain individuals who have particular goals and the requisite effectivity set - the knowledge and behaviours that an individual can produce so as to realise an affordance network or generate new affordance networks. An ecological perspective on knowing argues that knowing is the process of successfully engaging an intentionally bound system such that particular goals are accomplished (ibid 9).

Will and capability

Processes in ecosocial systems do not happen by themselves, they have to be created by people who have the will and capability to create them. They have to be imagined, actions and activities have to be planned to a greater or lesser degree, choices have to be made about what or what not to do, effects have to be observed and experienced and actions have to be modified in response to what happens. In short we are dealing with processes that are the product of individuals, engaging with situations in their contexts that may or may not be of their making but which they can exert influence over through their thoughts and self-determined actions. This process of creating and dealing with situations that coalesce over time into a process with intent is fundamentally a process of self-regulation as described Zimmerman (2000). Self-regulation can be represented as a continuous process involving forethought (imagination, planning and decision making), action/performance and self-reflection on action/performance (Figure 1).

Figure 1 Capability to create a learning process modelled as a process of self-regulation. Based on Zimmerman (2000:26)



Forethought

People don't engage in tasks, set goals and plan and work strategically if they are not motivated by strong personal agency. In particular, self-efficacy (personal beliefs about having the means to learn or perform effectively) and outcome expectations (personal beliefs that the outcomes will be worthwhile) are key features of personal agency.

Forethought is where decisions are made to engage with a situation. It's where problems, challenges and opportunities are imagined, ideas are generated and evaluated, where situations and contexts are assessed and decisions are made about how to approach and work with a particular situation in a particular context. Ideas on how to tackle a situation may be born from rational or intuitive thought processes. The more analytical/rational brain analyses tasks, sets goals and develops strategies. The intuitive brain may provide an idea or insight to a way of thinking about a problem. What is planned is influenced by contexts, self-efficacy, expectation of immediate and longer-term outcomes, levels of intrinsic interest and goal orientation (eg learning for assessment or mastery of a process or skill). For example, for some people the opportunity to be creative is a major stimulus and source of energy and motivation to thinking and subsequent actions. The way they will experience the situation and the potential for learning in the situation will be strongly influenced by this orientation to thinking, acting and being.

It is important to have knowledge that is relevant to the job in hand. In a new situation we often lack the knowledge we need to solve a problem or meet a challenge so knowing how to acquire knowledge or seek help from people who have relevant knowledge, are important aspects of dealing with a situation. The ability and motivation to be curious, to problematise and to imagine/find and explore perceived problems through questioning are important features of thinking at this stage. Asking the right questions and not being afraid to ask questions is essential. So is 'seeing' the potential of situations to provide many possible right answers. The ability to generate ideas (generative thinking) and to critically evaluate ideas to distinguish those that are most useful and motivating is important. This way of thinking draws on memory of past experience and also imagination stimulated by things outside of our own experiences. It is a creative as well as an analytical process.

Action, capability and performance

In the process of acting on our thinking we are integrating our knowledge and applying it within a situation and creating our knowing: knowing that is relevant to the particular situation, and also more generally which we might utilise in future situations. The doing (acting and performing) part of the self-regulation model distinguishes many sub-processes, eg notions of self-instruction, help-seeking and using the environment to create resources for learning. These are all crucial to creating a process for learning. 'Doing' is the process of engaging with emergent problems in real time, the structuring of the environment to create resources for learning, the adaptation and transfer of ideas to new contexts, the use of a repertoire of communication and inter- and intra-personal skills to achieve a goal, the juggling and prioritising of numerous tasks and the nurturing of relationships are all manifestations of the integrated actions we employ. These things all rely on self-efficacy and personal motivation to sustain them. We must also be aware of the consequences of our actions and adjust them if necessary.

The idea of capability embodies the ability to do and to accomplish. The capability to do something, eg to build and utilise a learning ecology, is defined and judged in terms of the appropriateness of what is being done, how well it is being done and the effectiveness in achieving goals of what has been done. Eraut focused on the capability exhibited by professionals in fulfilling their work role. He defined capability in terms of 'what individual persons bring to situations that enables them to think, interact and perform' and 'everything that a person (or group or organisation) can think or do' (Eraut 2009:6). Capability to create and use a learning ecology to achieve a particular purpose involves a complex set of skills, qualities and attitudes that must relate to the key dimensions of a learning ecology (Figure 5) namely,

- the ability to comprehend situations (problems and opportunities) in particular contexts
- to develop strategies for developing new knowledge and understanding in order to deal with particular situations
- to form new relationships and create new resources that will enable problems to be addressed and opportunities to be exploited.

Reflection and meaning making

The third element of the self-regulation model relates to the thinking we do after an event, after we have performed and after we have experienced the effects of our actions. This process allows us to stand back, to see the bigger picture, to make more sense of what happened and draw deeper meanings from our experience. Comparing our own performance and attributing causal significance to results requires evaluation against criteria, standards or previous performance - what is good/poor performance attributed to? This process consolidates our learning of our effects in particular situations and contexts which we can draw on in future.

Value of the self-regulatory model

The strength of the model of self-regulated learning is in its ability to integrate our critical (analytical) and creative (imaginative and intuitive) cognitive process, and our emotional, sensorial and physical worlds. It treats people as whole beings who not only orchestrate their actions in the world but who respond to the feedback they receive about the world and the effects they are having. Such a dynamic ecological model of learning is essential in any consideration of learning ecologies.

Time

Lemke points out that ecosocial processes have temporal dimensions as well as spatial dimensions and they have the capability to connect different spaces and contexts existing simultaneously and through time. In this way they form the bridges between past, present and future contexts and situations that we encounter or create in our lives.

Each scale of organization in an ecosocial system is an integration of faster, more local processes (ie activities, practices, doings, happenings) into longer-timescale, more global or extended [processes].... It is *relative timescale* that determines the probability and intensity of interdependence....and it is the circulation through the network of *semiotic*

artefacts (ie books, buildings, bodies) that enables coordination between processes on radically different timescales.

In this view the two fundamental questions for analyzing the dynamics of ecosocial systems—and human activities within them—are: What processes, what kinds of change or doing, are characteristic of each relevant timescale of organization of the system/ network? and, How are processes integrated across different timescales? (Lemke *ibid*: 275).

Our learning ecologies connect our moments and the thoughts and actions we undertake in such moments and organises them into more significant experiences through which we can begin to see new patterns of understanding and learning. Patterns that influence our beliefs, give us confidence in our own capability to act in the world and shape our future actions.

Our learning ecologies - part planned and deliberative, and part intuitive, accidental and opportunistic result from interactions with the world around us guided by a sense of purpose that has meaning to us. How we think and act reflects our experience, confidence, will and capability and these determine the processes we create. The process of imagining, designing, constructing and implementing our learning ecology changes us and our future actions as new ideas and understandings emerge, relationships evolve, objects, tools and other artefacts are made and invested with meaning, and new opportunities for learning arise.

The most amazing feature of developmental processes is that each step along a developmental trajectory changes the way the system interacts with its environment at the next step. There are no “shortcuts” in development; you must pass through each step in order to be prepared to take the next one because at each step you become a dynamically different system. Different dynamical possibilities are open to you. You have also extended your trajectory to a new timescale on which there are emergent phenomena, both in you and in your interactions with a larger-scale environment. (Lemke 2000: 284).

Our learning ecologies pervade every aspect of our life and are associated with every social interaction we make. They underlie the contexts we call family, work, study, hobbies and any other significant activity we engage in that involves us in interacting with our environment and the people in it. We create and develop our learning ecologies for particular purposes. The ecologies we develop to accomplish our work will be different to those we create for our hobbies and interests, and those we create with our families and friends. But there may well be connections across these ecologies and things we learn in one learning ecology are available for application in another.

It would seem that our self-created learning ecologies are an essential component of the way we learn and develop outside settings where our learning ecologies are either determined for us or severely constrained by others. They are the means by which we connect, orchestrate and integrate our lifewide and lifelong experiences and the learning and development we gain from them. They are the means by which we are able to transfer and connect our thinking, learning and development across the contexts that constitute our lives.

Systems

When we use the ecological metaphor in human society we are thinking in terms of whole systems that contain many interacting components. Urie Bronfenbrenner, a developmental psychologist, introduced his ecological paradigm for interpreting human development in the 1970s in a series of papers. He argued:

in order to understand human development, one must consider the entire ecological system in which growth occurs. This system is composed of five socially organized subsystems [A to E below] that help support and guide human growth. They range from the microsystem, which refers to the relationship between a developing person and the immediate environment, such as school and family, to the macrosystem, which refers to institutional patterns of culture, such as the economy, customs and bodies of knowledge (Bronfenbrenner, 1994:1643).

Ecologies are living systems containing a diversity of factors that interact with each other organically. They are self-organising, adaptive and fragile systems. We can use this biological metaphor to describe the social systems in which we live. Framing our experiences within an ecological paradigm underscores our connectivity and relationships with other people in our lifeworld and our physical, emotional, and cognitive behaviours as they occur in relation to specific environmental contexts and the situations we encounter. Bronfenbrenner's (1994) conceptual framework highlights the nested nature of ecosystems. Two of the levels (micro and meso) are of particular interest to learners and those who support learning.

A) The *microsystem* contains the factors within someone's immediate environment, the day-to-day situations they encounter and their relationships and communications with the people they meet or interact with using communications technology. This is the level of our lifeworld learning experiences, the level at which our individual situations and our responses to these situations matter to us and to the people they affect. This is the level at which we make decisions and plan what to do and how to do it and the level at which we act and use our capability (everything we can bring to a situation). This is the level at which we reflect on our experiences and the effects of our actions. This is the level of our learning ecology - the contexts, tools, technologies and resources we are able to draw upon to do what we have to do and the level at which we create new ecologies for learning and achieving.

B) The *mesosystem* encompasses the interrelations of two or more settings for example their wider experiences in life and the university course they are studying. It involves people who have an interest in promoting and supporting learning. It is the level at which guidance and tools are provided to help learners fulfil the requirements for their programme. Appropriately organised activity in the mesosystem enables people to learn more and better in their own microsystem.

C) The *exosystem* consists of settings that do not involve us directly, but which contains events that impact on us. This is the ecological level at which an institution adopts and embeds certain policies that affect the way a programme is designed, or determine in a broad sense the types of attributes the institution wants to see as an outcome of the education it provides.

D) The *macrosystem* is the wider society in which all other settings are nested including the socio-economic, cultural and political contexts. It includes government policies and strategies for promoting and supporting lifelong learning. This is the ecological level of the higher education system and the vision is that one day the system as a whole will embrace the idea of lifewide education.

E) The *chronosystem* encompasses change or consistency over time not only in the characteristics of the person but also of the environment in which that person lives (eg changes over the life course in family structure, socioeconomic status, employment, place of residence, or the degree of hecticness and ability in everyday life).

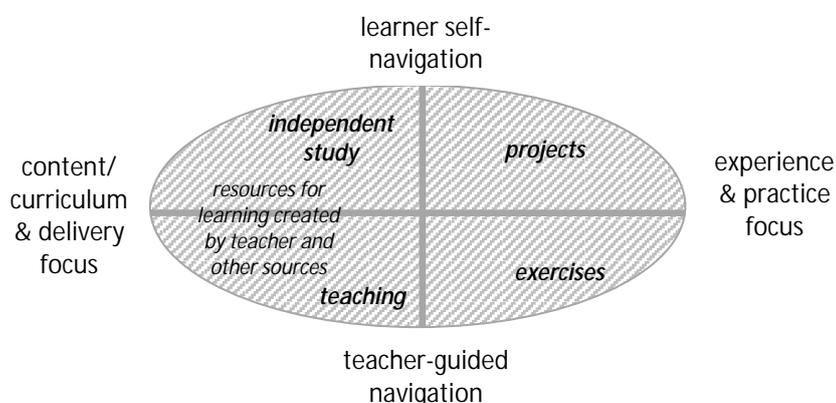
Lifewide education is primarily concerned with the level of the microsystem and individual's lifewide learning and their personal ecologies for learning, and with the mesosystem which hosts ecologies for learning that encourage, support and recognise individual's learning and development (such as the Lifewide Development Award). But we also need to be concerned with the exosystem - the level at which institutional beliefs and policies are created that lead to the adoption of a lifewide learning/personal learning ecology approach, and to the macrosystem which is the level at which society values this approach.

LEARNING ECOLOGIES IN EDUCATIONAL AND NON-EDUCATIONAL CONTEXTS

Learning ecologies are a feature both of formal educational settings, where the ecology is largely determined by institutions and teachers, and informal learning settings, where ecologies are largely determined by individuals and groups without the mediation of people whose business is education.

Richardson (2002) offers a simple conceptual tool to enable us to think about learning ecologies in formal and more informal learning situations (utilised in Figures 2 & 3).

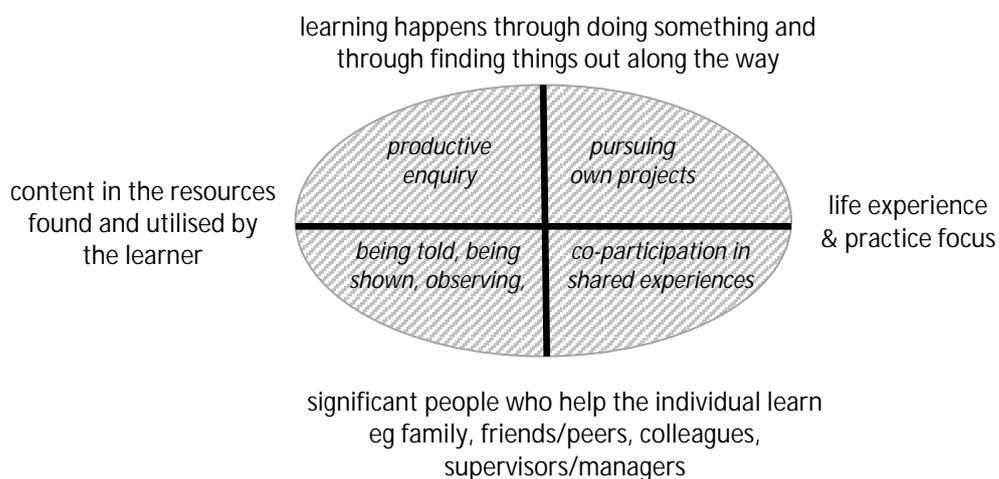
Figure 2 Learning ecologies in a formal educational setting such as a university (adapted from Richardson 2002:49). Learning is the explicit objective of this type of ecosocial system. The learning ecology (shaded) is populated with activities that are typical of a university course.



A traditional face-to-face university course creates an ecology for learning (Figure 2) that is designed, organised and implemented by a team of academics who have both disciplinary and pedagogic expertise working within an institutional environment that is full of support and resources to aid learning. There is a structure determined by the designers with objectives, content, resources and processes that engage learners in activities through which they learn and some of their learning is assessed. There is a supportive infrastructure within the institutional environment and teachers and learners, and learners and learners interact and the institutional spaces and technologies 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 perhaps virtual spaces where learners and teachers interact for the purpose of learning.

The activities in such a learning ecology are explicitly dedicated to learning - ie learning is the objective of this ecosocial system. 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 activity may be oriented towards transmission, guided discovery or self-directed learning and 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 they develop (see illustration in Jackson in press).

Figure 3 Learning ecologies developed in the informal world of learning and self-generated contexts outside formalised education (adapted from Richardson 2002:49). Learning is usually not the explicit objective of activity in this type of ecosocial system rather it is a bi-product of experience.



Outside the formal educational environment people create entirely different learning ecologies that reflect the different contexts, purposes and activities they engage in and generate across their lives for example - with family and friends, in the workplace with colleagues, in playing sport with team mates or companions, in pursuing hobbies or participating in activities organised by a club (Figure 3). These sorts of situations provide opportunities for the creation of a learning ecology through which purposes are prosecuted,

relationships are developed, people interact and collaborate, and goals are accomplished. Learning and gained through these sorts of ecologies is rarely measured or assessed but it contributes significantly to the development, success and wellbeing of individuals.

Eraut (2004) raises interesting questions about the extent to which people are conscious of their learning while they are engaged in activities where learning is not the primary objective ie they are trying to achieve something where learning is a bi-product of the process of trying to accomplish something (Eraut's 2004: 249). Rogers (2003) uses this distinction to argue there might be a continuum of learning consciousness.

At one extreme lie those unintentional and usually accidental learning events which occur continuously as we walk through life. Next comes incidental learning - unconscious learning through acquisition methods which occurs in the course of some other activity... Then there are various activities in which we are somewhat more conscious of learning, experiential activities arising from immediate life-related concerns, though even here the focus is still on the task... Then come more purposeful activities - occasions where we set out to learn something in a more systematic way, using whatever comes to hand for that purpose, but often deliberately disregarding engagement with teachers and formal institutions of learning... Further along the continuum lie the self-directed learning projects ... More formalized and generalized (and consequently less contextualized) forms of learning are the distance and open education programmes, where some elements of acquisition learning are often built into the designed learning programme. Towards the further extreme lie more formalized learning programmes of highly decontextualized learning, using material common to all the learners without paying any regard to their individual preferences, agendas or needs. (Rogers 2003: 41-2)

While there are no clear boundaries between each these categories Rogers saw value in distinguishing between task-conscious learning and learning conscious learning.

Task-conscious learning goes on all the time. It is 'concrete, immediate and confined to a specific activity; it is not concerned with general principles' (Rogers 2003:18). Examples include much of the learning involved in parenting or with running a home. In this situation whilst the learner may not be conscious of learning, they are aware of the specific task they are engaged in and what they want to achieve by accomplishing the task. Tough (1971) coined the term 'learning project' to describe 'a sustained, highly deliberate effort to learn' (ibid 7) but few people would use a term like learning project to describe a sustained effort to learn or master something new rather; they would use a term like interest, hobby, task, challenge, tackling a problem, or having an adventure. Nevertheless, it is our learning projects that stimulate our personal learning ecologies and it is through our learning ecologies that we come to know, change and achieve our goals and ambitions.

Learning-conscious learning arises when people are aware that the task they are engaged in entails learning and the job of facilitation, whether it is through a teacher directing a class, a coach or mentor guiding someone in a work situation or a parent guiding a child, is to make people more aware of their learning or what they need to learn.

Categorisation of learning ecologies

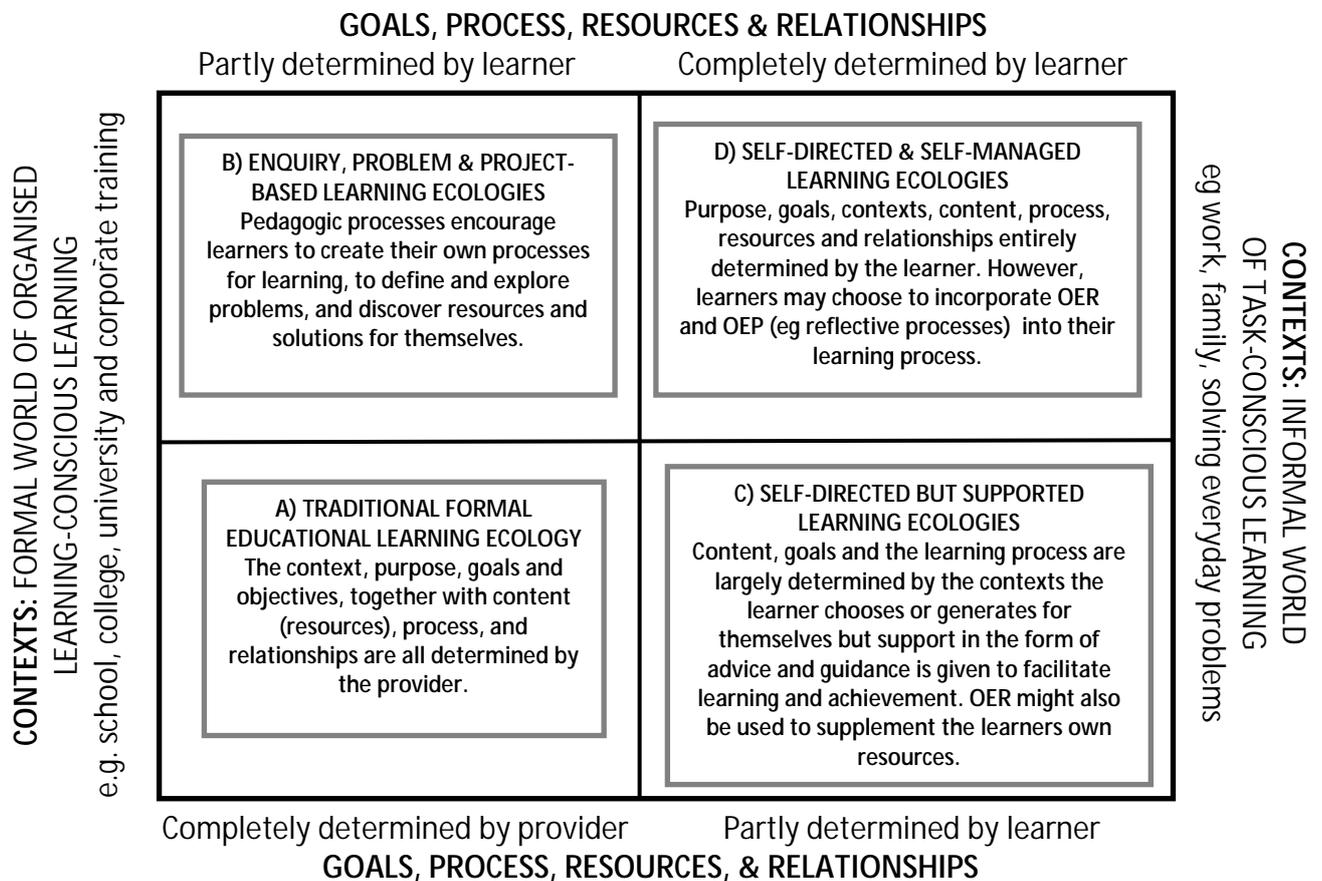
Accepting the inherent problems of simplistic representations, we might create a framework (Figure 4) to help visualise the relationship between individuals' learning ecologies and educational practices that support and recognise the outcomes of learning from such ecologies.

In this figure the vertical axis is concerned with variations in the *process* of learning including the purposes and goals, the resources that will be used and the relationships through which learning is likely to occur. Variations in this conceptual space reflect: - Who determines the contexts, purpose and goals for learning? Who designs and orchestrates the learning process and determines what knowledge resources, tools and relationships will be used to aid learning? Is it the teacher, the learner or a group of learners or is it a combination of these agents?

The horizontal axis is concerned with the contexts in which learning takes place. This conceptual space might be divided into environments like school, college, university and

corporate training situations where the explicit purpose is to learn (learning conscious learning of Rogers 2003), and informally structured environments in which learning is a bi-product of engaging in experiences or tasks that are not explicitly for the purpose of learning (task-conscious learning of Rogers 2003).

Figure 4 Categorisation of learning ecologies and their educational contexts. (OER - Open Educational Resources, OEP - Open Educational Practices)



Four different learning ecology scenarios are depicted in Figure 4.

A) TRADITIONAL FORMAL EDUCATIONAL LEARNING ECOLOGY

This is the classroom-based learning ecology where teachers working within a traditional teacher-student relationship 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 with for the explicit purpose of learning. Learning and achievement are assessed by the teacher or by a recognised external authority like an examination board. In this type of learning ecology the learner has little or no involvement in the design of the learning process or the resources they will utilise.

B) ENQUIRY, PROBLEM & PROJECT-BASED LEARNING ECOLOGIES

There are however pedagogies like problem-based, project-based and enquiry-based learning, that actively encourage learners to define and explore problems, build and utilise relationships for learning, and discover resources and possible solutions for themselves. Such practices help learners develop the will, capability and confidence to create their own learning ecologies in the world outside formal education.

C) SELF-DIRECTED BUT SUPPORTED LEARNING ECOLOGIES

There are educational contexts like for example Negotiated Work-Based Learning (NWBL) or Lifewide Education where the contexts for learning are primarily concerned with contexts that provide unstructured learning environments - like the work place, community settings, families and other social situations. Such educational contexts require learners to be self-directed and to create their own learning ecology. They determine either independently or through negotiation the goals and objectives, process, relationships and resources in their learning ecology but support in the form of advice and guidance might also be given to facilitate learning and OER might also be used to supplement the learners own resources.

D) INDEPENDENT SELF-DIRECTED LEARNING ECOLOGIES

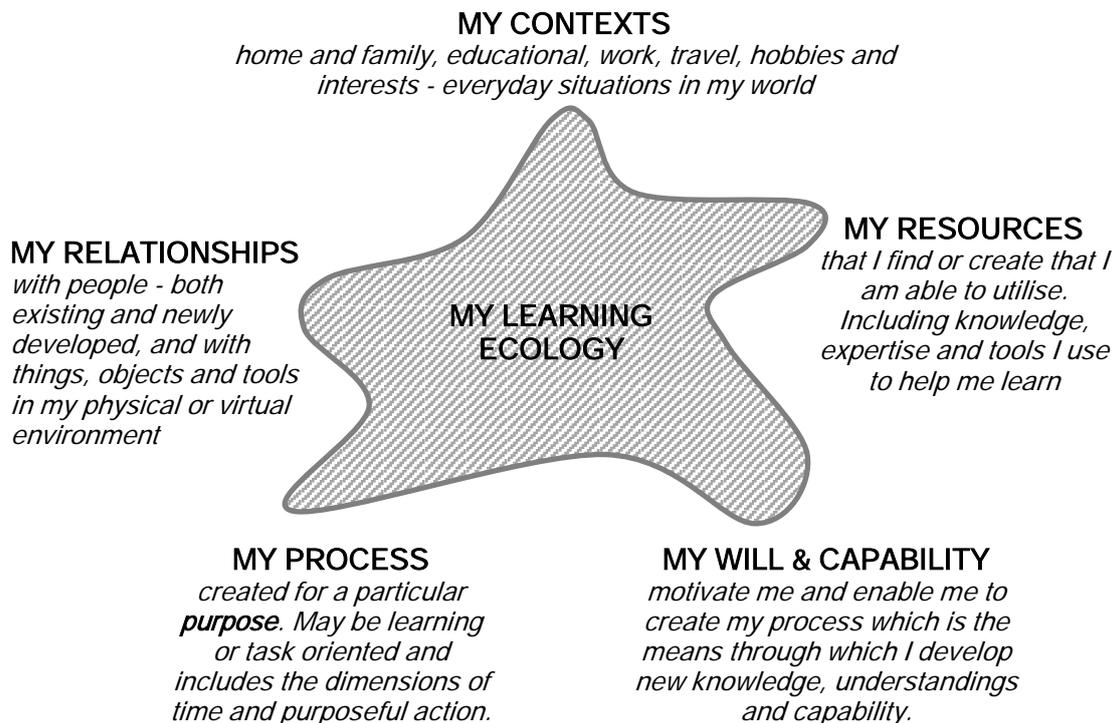
This conceptual space is where people create their own learning ecologies for their own purposes typically for their own learning projects in work or other self-generated contexts. Their learning is not driven by the need or desire for formal recognition by a credible educational authority. They determine goals, contexts, content, process, resources and relationships. Learners may choose to incorporate Open Educational Resources and Open Educational Practices (eg reflective processes) offered by formal education providers into their learning process.

An educational institution may support learners' learning ecologies in some or all of these conceptual spaces but all too often the bulk of a students' higher education experience is located in the space labelled *formal educational learning ecology*. However, even when a programme is not designed to encourage learners to create their own ecologies for learning, some learners may be inspired and motivated to create their own learning ecologies that enable them to be and become the scientist, lawyer, historian or any other discipline-based practitioner they want to be.

DEFINITION & CONCEPTUAL AID

Having considered, at some length the conceptual basis for the idea of learning ecologies, I offer my own definition and conceptual tool to aid understanding. Integrating the ecosocial perspectives of Lemke, with Barron's original definition of a learning ecology, and connecting the idea of learning ecologies to the sustained processes we create to achieve something we value (ie Tough's concept of learning project), leads to the following personalised definition of a learning ecology - *the process(es) I create in a particular context for a particular purpose that provide me with opportunities, relationships and resources for learning, development and achievement.* A graphical representation of this working definition is shown in Figure 5.

Figure 5 Key components of an individual's learning ecology



The illustration is heuristic rather than hierarchic. It represents the integration and interdependence of the elements of *context, relationships, resources, (the most important being knowledge and tools to aid thinking), and an individuals will and capability to create a learning process or learning ecology for a particular purpose.* Such actions may be directed explicitly to learning or mastering something but more likely they will be primarily concerned with performing a task, resolving an issue, solving a problem, or making the most of a new opportunity.

Learning to drive

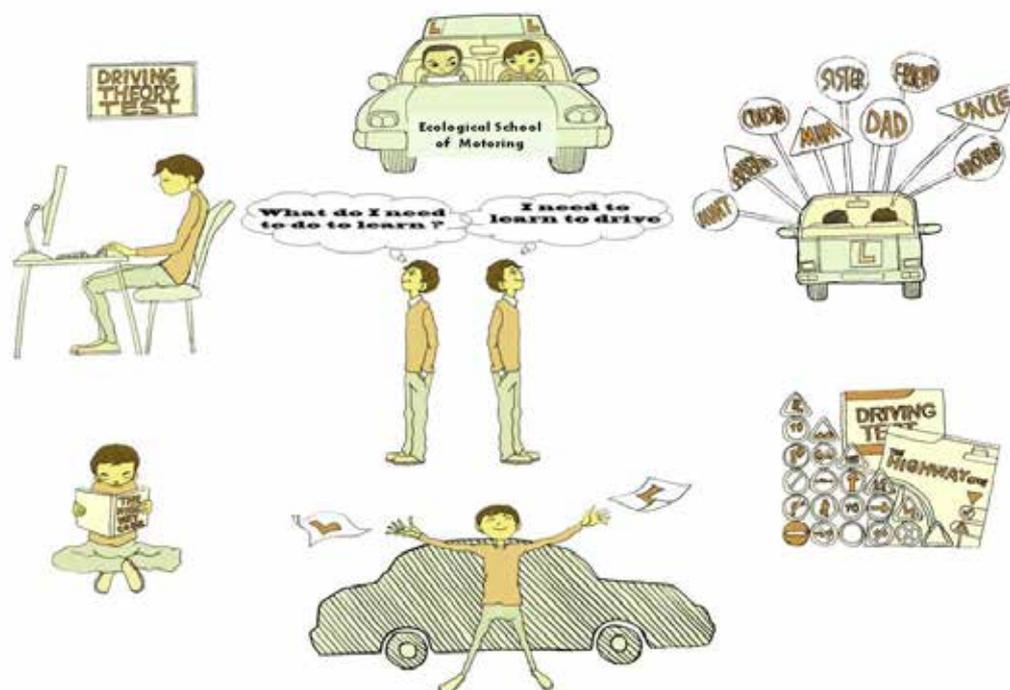
We might illustrate the idea of a personal learning ecology through the scenario of learning to drive a car (Figure 6) an important learning project for many young adults. The scenario involves the learner in a comprehensive way and it contains both formal learning-conscious and informal task-conscious learning (Rogers 2003). Ultimately, a body of knowledge has to

be learned and embodied and a level of driving competency has to be demonstrated in order to pass the driving test.

The process begins when the learner declares their intention to learn to drive and enter themselves for the driving test. The individual, often with parental guidance and support, creates a new ecosystem to learn and develop themselves in line with this objective. The ecosystem they create includes context, resources, relationships and process and might typically include:

- several months of dedicated activity
- access to a car so they can practice
- access to information about driving and the rules of the road - either as a book/booklet, DVD or on-line resources
- a range of driving instructors including a trained professional instructor and untrained family members and friends
- physical environment - safe areas for practising - like empty car parks and quiet roads - then public highways with various traffic conditions

Figure 6 Personal learning ecology created in order to learn to drive a car and pass the driving test. Includes my process for learning to drive, the contexts in which I learn to drive, and a set of relationships and resources that enable me to learn.



This scenario provides a good example of a learner interacting in an organised way with their *context* - their social, physical and virtual environment in order to achieve a specific goal - to learn to drive. The *process* they create to learn may well be aided by a professional driving instructor but the learner also typically draws on the knowledge and experience of people they know (*relationships*) - family and friends who are not professional instructors. The

learner develops practical skill and simultaneously theoretical knowledge, together with knowledge that is gained through the experience of driving. In effect they are developing their own case examples of situations they encounter on different sorts of roads in different sorts of driving conditions. Experience is accumulated in a range of contexts - road, traffic, day time/night time and weather. As they participate in this process they can tap into the experiential knowledge (*resources*) of the people who accompany them on journeys as both drivers and passengers and their new awareness also encourages them to be more observant as a passenger so that they begin to think like a driver, reading and anticipating situations even when they are not driving. As they practice driving they must operate in a self-regulatory way, observing their environment and being aware of their actions and

responses and adjusting to the feedback they receive. After each session there may also be a period of reflection when incidents and actions are reconsidered, particularly if mistakes have been made, so that learning can be gained from experience.

This ecosystem, for the purpose of becoming a competent driver, may last several months and perhaps involve 50-100 hours of time and effort in which learning and its embodiment in their driving practice is the primary goal. The process includes mastery of a body of procedural knowledge as well as the actual embodiment of knowledge and skill in the performance of driving and they have to demonstrate this to a defined standard in order to pass their test. Failure requires more preparation and another test.

VALUE OF AN ECOLOGICAL PERSPECTIVE

This chapter set out to examine the idea of learning ecologies and consider the value of an ecological perspective for lifewide learning, education and personal development. There are at least four reasons why an ecological perspective has value.

Conceptual Value

The concept of a learning ecology provides us with the means to visualise the dynamics of a complex self-created learning process and to appreciate how the different elements of the ecology - contexts and situations, purpose, will and capability, relationships and resources, fit together in a dynamic unfolding process.

An ecological perspective conveys learning and personal development (adaptation and change) as a living organic, 'messy' and holistic process. All too often in formal education, learning is viewed as the acquisition of prescribed, codified, abstract, decontextualised knowledge in ways that are largely determined by teachers and educational institutions. The reality of everyday learning outside formal education is very different when needs, interests and curiosity drive an individual's motivation and they have to find the resources they need to learn from the world that they can act in. This process is necessarily less systematic, more intuitive and organic than the professionally designed and organised world of formalised education. An ecological perspective adds value to the way we currently view a higher education: it opens new possibilities for enhancing an individual's ability to act in the world.

We have argued that learning is not simply scoring high on a test or assignment, but should involve increasing possibilities for action in the world. Learning ...is about successfully participating as part of an ecosystem, an intentionally bound network [of affordances], and it fundamentally involves increasing opportunities for action in the world. Life-world expansion, [is] the ultimate trajectory of learning.... (Barab and Roth 2006:11)

Practical value to the learner

The value of an ecological perspective to a learner is that it encourages them to see learning as a process that connects them in a holistic way to other people and to their environment. In particular it enables them to appreciate the ways in which they engage with contexts by creating processes that utilise and develop relationships and resources in order to do what they have to do in the many contexts that constitute their lives.

The ecological perspective emphasises that this is a living dynamic process which they orchestrate and improvise according to the effects of their actions and the feedback they receive on the effects of their actions. Such an appreciation lends itself to the idea that we continually nurture and grow our learning ecologies rather than starting with a blank sheet of paper each time we have to learn something new. An ecological view of the relationship between learning, developing and living will also help prepare student learners for the ecological worlds of organisations they will inhabit when they progress into work and perhaps raise their awareness of the important link between their learning ecology and living a sustainable life. An ecological perspective will also encourage learners to trust their own instincts.

We learn in relationship and in context - not in isolation. This is why our learning ecology is so important to us..... It tells us about our learning environment and interrelationships - with others, with our culture, work and with our educational institutions. And importantly, it tells us about our learning relationship with ourselves. We need to trust ourselves to establish a learning ecology that is meaningful, authentic and supportive of our growth and personal wellbeing (Staron 2013:7)

Practical value to a teacher or mentor

The value of an ecological perspective to a mentor or teacher is that it firstly encourages them to appreciate their own learning processes in a holistic way - to appreciate how they use and expand their own learning ecology to meet the challenges of new learning and development projects. Secondly, it might encourage them to view their own strategies for encouraging students' learning as an ecological process that they have designed and resourced and perhaps this may open up new possibilities for contexts, relationships and interactions as they appreciate that the learning ecologies of their learners' extend beyond the classroom.

For mentors who are encouraging and supporting lifewide learning, an appreciation of a particular learner's learning ecology may enable them to help their mentees consider other affordances for learning and development in their lives as they engage with specific learning projects. After examining a learner's learning ecology a mentor might reflect on and share their perspectives (Staron 2011:154) on such matters as:



- Assumptions - whether their assumptions about learning help them fulfil their aspirations.
- Strengths - whether their strengths align with their values, goals and purpose.
- Reality - recognise that their reality (or context) is both 'internal' and 'external'.
- What works and what does not work - so that they focus on what works for them and helps achieve their dreams.
- Different perspectives - from which perspective they view their learning ecology, whether mental, emotional, physical and/or spiritual, or whether through a formal, informal or lifewide learning perspective, and what all this tells them about their relationship with their learning environment.

Political value

The ecology of our learning and how we develop it for particular purposes is key to knowing how to learn and to our ongoing process of learning how to learn. Knowing how to learn and continuing to develop capability for learning throughout our life (captured in the expression 'learning to learn'), are political as well as educational issues. In 2009 the EU Directorate General for Education and Culture commissioned a foresight study aimed at visualising the Future of Learning (Redecker et al 2011) the overall vision emerging from the study is that 'personalisation, collaboration and informal learning will be at the core of learning in the future. The central learning paradigm is characterised by lifelong and lifewide learning and shaped by the ubiquity of Information and Communication Technologies (ICT)'. The key words - personal, collaborative, informal and lifewide - have particular meaning when viewed through the lens of personal learning ecologies.

While the concept of personal learning ecologies does not yet feature in EU and UK educational policy the concept of *learning to learn* has. A report by an EU working group on 'Key Competencies' contains the following definition.

'Learning to learn' is the ability to pursue and persist in learning, to organise one's own learning, including through effective management of time and information, both individually and in groups. This competence includes awareness of one's learning process and needs, identifying available opportunities, and the ability to overcome obstacles in order to learn successfully. This competence means gaining, processing and assimilating new knowledge and skill as well as seeking and making use of guidance. Learning to learn engages learners to build on prior learning and life experiences in order to use and apply knowledge and skills in a variety of contexts: at home, at work, in education and training. Motivation and confidence are crucial to an individual's competence.' (Education Council, 2006 annex, paragraph 5).

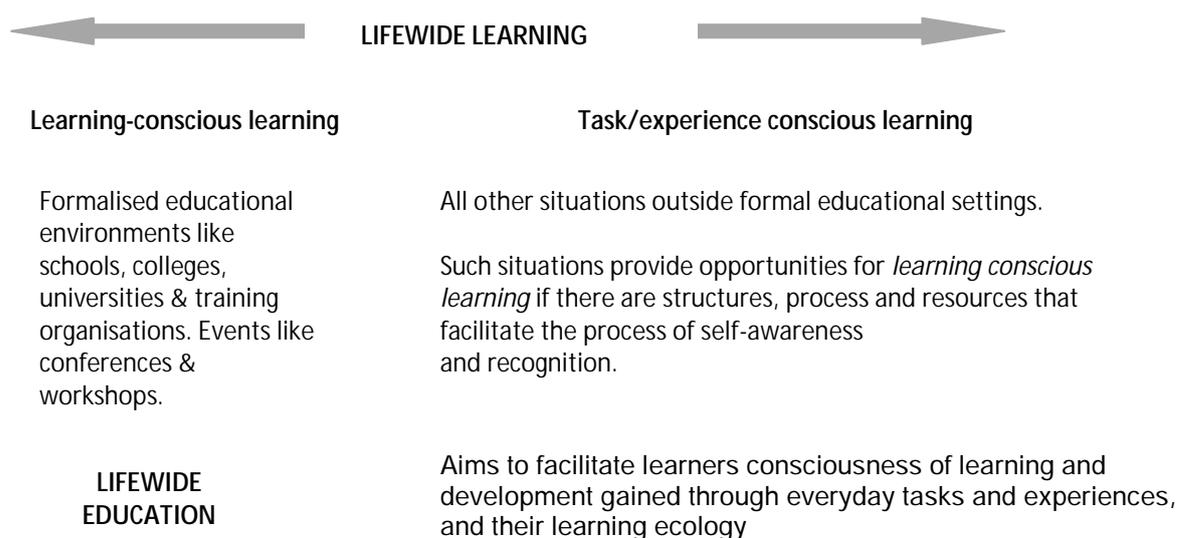
The idea of personal learning ecologies is simply another way of representing these essential orientations, dispositions and capabilities that we require in order to undertake significant learning projects - to pursue effective and sustained action in the world. However, the idea of being able to create a learning ecology extends beyond *being aware of one's own learning process and needs* to *creating one's own processes for learning in order to fulfil those needs*. Furthermore, it adds to this abstract list of learning to learn characteristics in that it embeds them in the specific social contexts, relationships and situations that comprise everyday life. It

gives them meaning and significance in the contexts of our purposes, values and beliefs. Encouragement for people to view their own learning as an ecological process within a lifelong-lifewide conception of learning might help bridge the gap between the current learning and education paradigm on which our education system is founded and the paradigm of learning in the world outside of formal education that is outlined in JRC's Foresight work.

Value to Lifewide Education

Lifewide Education (Jackson 2011, Barnett 2011) provides an example of an organised educational process (learning ecology) that seeks to encourage and recognise learning gained through activities that are not explicitly for the purpose of learning. In Rogers' terms the processes and practices of lifewide education are trying to encourage people engaged in *task oriented learning* to be more *conscious of their learning* (Figure 7).

Figure 7 Relationship of learning and task conscious learning (Rogers 2003) and the role of Lifewide Education to facilitate learning consciousness in task- and experience-oriented activity.



Lifewide educational designs focus attention on the learner's own purposes and goals and their understandings of how they want to develop themselves to achieve their purposes. The emphasis is on self-organised and self-managed learning in the learner's own contexts. The learner determines their pathway(s) for development and they draw on their own experiences and the people they interact with as their main resource for learning. Each learning and development project requires learners to utilise and develop further their own learning ecology. The ecosystem is based on *the learner's* own purposes, life experiences and opportunities and constraints, and it develops in ways that the learner primarily determines. The significant others in this ecological framework are mentors, whose role is to facilitate planning, decision making and reflection, and the people that learners themselves incorporate into their ecology for learning.

Lifewide Education encourages learners to be more aware of their ecosystems for learning: the processes they create to learn and perform in the contexts and situations that comprise their lives. The learner is viewed as the designer and implementer of *their* own integrated and meaningful life experience. An experience that incorporates *their* formal education as one component of a much richer set of experiences that embrace all the forms of learning and achievement that *they* believe are necessary to live a meaningful and fulfilled life. An ecological perspective enriches our understanding of the meaning of lifewide learning. It might be expected that an institution adopting a lifewide education approach to learning and personal development would not only pay attention to the role of learning ecologies in lifewide learning but also enable learners to understand and create their own learning ecologies.

ACKNOWLEDGEMENTS

I am very grateful to all the people who contributed to the learning ecology that underlies this and a companion chapter including the writers cited below, contributors to thematic issue of Lifewide Magazine (September 2013), the people who contributed to two workshops on learning ecologies in June 2013, members of my family and others who contributed narratives of personal learning ecologies. Professor John Cowan, Dr Jenny Willis and Professor Ronald Barnett were particularly important to my learning ecology through their reviews and constructive suggestions at various stages during the preparation of this chapter.

REFERENCES

- Barnett, R. (2011) Lifewide education: a new and transformative concept for higher education. in N. J. Jackson (ed) *Learning for a Complex World: A lifewide concept of learning, education and personal development*. Authorhouse 22-38
- Barab, S. A., & Roth (2006) Curriculum-based ecosystems: Supporting knowing from an ecological perspective. *Educational Researcher*, 35 (5), 3-13
- Barron, B. (2006) Interest and Self-Sustained Learning as Catalysts of Development: A Learning Ecology Perspective. *Human Development* 49:193-224 Available on-line at: <http://life-slc.org/docs/barron-self-sustainedlearning.pdf>
- Bronfenbrenner, U. (1994). Ecological models of human development. In *International Encyclopedia of Education, Vol. 3, 2nd. Ed.* Oxford: Elsevier.
- Eraut, M. (2004) Informal learning in the workplace *Studies in Continuing Education*, Vol. 26, No. 2, 247-273
- Eraut, M. (2009) How Professionals Learn through Work. In N. Jackson (ed.) *Learning to be Professional through a Higher Education*. Online at <http://learningtobeprofessional.pbworks.com/How-professionals-learn-through-work>
- Education Council (2006) Recommendation of the European Parliament and the Council of 18 December 2006 on key competencies for lifelong learning. Brussels: Official Journal of the European Union, 30.12.2006
- Germain, C. B. and Gitterman A (1994) *Ecological Perspective*. available on-line at http://www.uncp.edu/home/marson/348_ecological.html
- Jackson, N.J. (2011) The lifelong and lifewide dimensions of living, learning and developing. In N. J. Jackson (ed) *Learning for a Complex World: A lifewide concept of learning, education and personal development*. Authorhouse 1-21



- Jackson, N. J. (2013) Personal Learning Ecology Narratives. In N. J. Jackson and G. B. Cooper (eds) *Lifewide Learning, Education and Personal Development* e-book available on line at: <http://www.lifewidebook.co.uk/research.html>
- Lemke, J. (1997) Cognition, Context, and Learning: A Social Semiotic Perspective" in D. Kirshner and A. Whitson, Eds., *Situated Cognition: Social, Semiotic, and Psychological Perspectives*. (pp. 37-55). Hillsdale, NJ: Erlbaum.
- Lemke, J. (2000) Across the Scales of Time: Artifacts, Activities, and Meanings in Ecosocial Systems. *Mind, Culture and Activity* 7 (4), 273-290 available on-line at
- Redecker, C., Leis, M., Leendertse, M., Punie, Y., Gijsbers, G., Kirschner, P. Stoyanov, S. and Hoogveld, B. (2011) *The Future of Learning: Preparing for Change*. European Commission Joint Research Centre Institute for Prospective Technological Studies EUR 24960 EN Luxembourg: Publications Office of the European Union <http://ipts.jrc.ec.europa.eu/publications/pub.cfm?id=4719>
- Richardson, A. (2002) An ecology of learning and the role of elearning in the learning environment Global Summit Education AU Limited available at: <http://unpan1.un.org/intradoc/groups/public/documents/apcity/unpan007791.pdf>
- Rogers, A. (2003) *What is the difference? a new critique of adult learning and teaching*, Leicester: NIACE.
- Seimens, G. (2007) Connectivism: Creating a Learning Ecology in Distributed Environments in T. Hug (Ed) *Didactics of Microlearning: Concepts, Discourses and Examples* Munster; Waxman 53-68
- Staron, M. (2011) Connecting and integrating life based and lifewide learning. In N. J. Jackson (ed) *Learning for a Complex World: A lifewide concept of learning, education and personal development*. Authorhouse 137-159
- Staron, M. (2013) Learning Ecology a Matter of Trust. *Lifewide Magazine* available at: <http://www.lifewidemagazine.co.uk/>
- Tough, A. (1971) *The Adult's Learning Projects: A fresh approach to theory and practice in adult learning*. Available at: <http://ietl.org/tough/books/alp.htm>
- Zimmerman, B. J. (2000) Self-regulatory Cycles of Learning. In G. A. Straka (ed.) *Conceptions of Self-directed Learning, Theoretical and Conceptual Considerations*. New York: Waxman,

END NOTE

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- ^A Open Space Learning Blog available at: http://www2.warwick.ac.uk/fac/cross_fac/iatl/activities/projects/osl-final/technology/ecology/

The science of ecology in its pure form studies the relationships of organisms with their environment. "Organisms" means all living entities; this definition excludes relationships between non-living entities as a possible object of study for ecology. The term "environment" is meant in the sense of "the surrounding world," i.e., all entities, living or not, which surround a living entity. This process is experimental and the keywords may be updated as the learning algorithm improves. This is a preview of subscription content, log in to check access. Preview. van der Ploeg S.W.F. (1982) Basic Concepts of Ecology. In: The Natural Environment and the Biogeochemical Cycles. The Handbook of Environmental Chemistry (Part B), vol 1 / 1B. Nevertheless, some concepts of basic ecology learned by outdoor learning were less concerned, while it was very particular to construct sophisticated understanding about more difficult concept of ecology and environmental knowledge in higher level of school. More, the effect of outdoor learning on student conceptualization was less discussed. The findings will benefit teacher to determine concepts of. Copyright © 2017, the Authors. Published by Atlantis Press. 2. Ecological Concepts and Principles 3. Application of Ecological Concepts and Principles Glossary. List of Figures figure 1. Examples of Biodiversity Components and Attributes figure 2. The Contribution of Biodiversity to Human Well-Being figure 3. Overview of Concepts, Principles and Applications. v vi 1 7 19 32. 2 3 5. to maximize learning " Given that humans are a powerful agent of change, make science based decisions. , , 2 Ecological Principles. The concept of ecological resilience is consistent with the notion that ecosystems are complex, dynamic and adaptive systems that are rarely at equilibrium; most systems can potentially exist in various states.