New Opportunities for Media Enabled Learning through a Life-wide Curriculum
'Ideas Paper for a Workshop'

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incorporating a significant contribution from a paper by
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This ideas paper was written for a workshop at the 'Media Enhanced Learning' Conference in Belfast January 2010. It explores and tries to integrate two thematic ideas – life-wide learning and how the involvement of learners with digital media has an essential role to play in the development and accomplishment of learners through their life-wide learning experiences. New media technology is an important agent in facilitating learning and playful or productive social interaction through which new possibilities emerge. It helps people find out the things they need to find out in order to do the things they want to do. It enables people to broadcast their views, their creative products and performances and it encourages others to connect to, draw meaning from and engage with these personal expressions of being a human being. Combining these two ideas opens up new possibilities for higher education to recognise and value such forms of learning and self-expression as learners become who they want or need to be. In the world of life-wide education, new media technologies, such as audio and video become the essential agency for learning rather than the conduits for learning.

The paper is a **re-mix** of previous papers written by the author integrating new content and ideas about new media and the learning promoted by the culture of participation in new media, derived from three principal sources (Jenkins et al 2006, Ito et al 2008 and Thomas and Seely-Brown 2009). Because I have made extensive use of the content of Douglas Thomas and John Seely-Brown's stimulating paper I have accorded them co-producer status.

The purpose of the paper is to stimulate your imagination to encourage you to connect existing practices and create new ideas for educational designs. The paper is not intended to be complete. In the spirit of collaborative learning and co-production the paper is offered in both word format on the **life-wide learning wiki** so that you can add your own practice examples, ideas, opinions and URL links to other interesting and relevant work. Please make your additions in colour font and send them to the author norman.jackson@surrey.ac.uk for integration into the revised paper. All contributions will receive full acknowledgement in the paper.

Generative questions: **in the context of a life-wide curriculum**, '**how can I create new designs that will utilise the potential of new media to engage learners individually and collaboratively, and contribute to the development of their media literacy skills and capabilities?**'

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http://www.sceptreserver.co.uk/sceptre/

This is a long paper and you may not have the time to read it all at once. Here are is the overall structure if you want to be selective.
- Pg 3-5 sets out the wicked problem of preparing students for a complex world and reasons for why higher education should give serious consideration to embracing the idea of life-wide education.
- Pg 5-12 discusses the ways of knowing we need to master for a rapidly changing and emergent world. Within this pg 6-8 Douglas Thomas and John Seely Brown offer useful perspectives on man the knower, maker and player which enable us to connect in a meaningful way to new media technologies.
- Pg 12-16 describes the idea of a life-wide curriculum and offers an example of how a university might operationalise the idea. This is to provide you with a concrete example within which you might experiment, but you may have your own educational context that can inspire you.
- Pg 16-20 outlines some of the possibilities new media affords and describes the new literacies that are required to make effective use of and be creative with such media. Appendix 2 gives some Web 2.0 examples of interactive web-based media which could be utilised.

Introduction

How <u>we</u> prepare people for a life-time of uncertainty and change, and enabling them to work with the ever increasing complexity of the modern world, is a challenge shared by higher education institutions and educationalists all over the world. Directly or indirectly, this problem is the main force driving change in Tertiary education. But what <u>we</u> do is only one side of the educational equation. Learners are busy preparing themselves through the many things they do outside formal education every day of their lives. This is particularly the case with the topic of this paper – learners' engagement with the media rich world they inhabit.

The idea of *learning for a complex world* has stimulated much of the work that we undertaken at the University of Surrey's, Centre for Excellence in Professional Training and Education (SCEPTrE)[1]. Thinking about what learning for a complex world means led me to conclude that the only way we can prepare ourselves for the complexities and challenges that lie ahead is to take the whole of our lives into consideration. It seems self evident that we are who we are because of the way we have lived our lives and the way we currently live our lives and our lives hold the potential for who we want to become. Education, although important, is only one part of the experiences that make up our lives: experiences that are generally not considered in the higher education enterprise. This way of thinking led me to the conclusion that we need to break out of the paradigm within which we currently create the HE curriculum and create a new core concept *life-wide learning through a life-wide curriculum* that honours the more holistic engagement with life and the personal development of learners while they are engaged in a higher education.

Jackson (2008) set out two propositions for evaluation. Firstly, life-wide learning provides us with the richest concept of learning with the potential to embrace, recognise and value all the forms of learning that make us who we are and which are necessary to enable us to become who we want or need to become. Secondly, a life-wide curriculum contains more potential for participation and learning than any other curriculum and adopting the idea of a life-wide curriculum changes our understanding of what counts as learning and where, when and why learning occurs. An attempt is being made to create new life-wide educational practices inspired by these ideas at the University of Surrey[2].

This paper has two purposes. Part 1 explains the idea of life-wide learning through a life-wide curriculum and examines how the emergent phenomenon of new media and the cultures of participation that are forming around the use of these forms of media might relate to and be integrated into the concept. Part 2 provides a starting point for examining the ways in which practical use might be made of new media technologies to enhance students' learning experiences and their personal development and help Tertiary institutions recognise and value learning and development gained through wider life-experiences.

I have to admit that in preparing this paper my perspective shifted from simply seeing a life-wide learning/curriculum framework as a means of recognising and valuing learning and development being achieved through learners' engagement with new media, to seeing these forms of learning and participation as being an essential component of the ways of learning and being that such frameworks should be aiming to promote in all students' experiences of higher education.

PART 1

The 'wicked' educational problem we are trying to tackle

The now famous 'Shift happens'?[3] video clip portrays in a deliberately provocative way, the sort of globally connected, fast changing and uncertain world in which our students' futures lie. While we might question some of the statistics in the film the central message is clear. We live in a world where change is exponential and we are currently helping to prepare students:
- for jobs that don't yet exist

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[1] http://www.sceptreserver.co.uk/sceptre/
[2] http://lifewidelearning.pbworks.com
[3] http://www.youtube.com/watch?v=ljbI-363A2Q

- using technologies that have not yet been invented
- in order to solve problems that we don't know are problems yet.

In short, we have a responsibility to prepare our students for a lifetime of uncertainty, change, challenge and emergent or self-created opportunity. It may sound dramatic but the reality is that the majority of our students will have not one but several careers; they will have to change organizations, roles and identities many times and be part of new organisations that they help create or existing organisations that they help to transform. Many will have to invent their own businesses in order to earn an income and or create and juggle a portfolio of jobs requiring them to maintain several identities simultaneously. Gone are the days where professionals enter a profession that hardly changes during their career.. just look at medicine if you want to see professions in a state of radical transformation. Preparing our students for a lifetime of working, learning and living in uncertain and unpredictable worlds that have yet to be revealed is perhaps one of the greatest responsibilities and challenges confronting universities all over the world.

Preparing students for an increasingly complex world is a 'wicked problem' (Rittel and Webber 1973, Conklin 2006). What emerges from all the technical, informational, social, political and cultural complexity that we are immersed in are problems which cannot be solved through rational, linear problem working processes because the problem definition and our understanding of it evolve as new possible solutions are invented and implemented.

Douglas Thomas and John Seely Brown (2009:1) crystallise the educational challenge to living in a world of constant and rapid change.

'The educational needs of the 21st century pose a number of serious problems for current educational practices. First and foremost, we see the 21st century as a time that is characterized by constant change. Educational practices that focus on the transfer of static knowledge simply cannot keep up with the rapid rate of change. Practices that focus on adaptation or reaction to change fare better, but are still finding themselves outpaced by an environment that requires content to be updated almost as fast as it can be taught. What is required to succeed in education is a theory that is responsive to the context of constant flux, while at the same time is grounded in a theory of learning. Accordingly, understanding the processes of learning which underwrite the practices emerging from participation in digital networks may enable us to design learning environments that harness the power of digital participation for education in the 21st century'.

While Ron Barnett (2000) summarises very well the challenge of preparing students for a supercomplex world.

'Higher education is faced with not just preparing students for a complex world, it is faced with preparing students for a supercomplex world. It is a world in which we are conceptually challenged and continually so…. This supercomplexity shows itself discursively in the world of work through terms such as flexibility, adaptability and self-reliance. In such terminology, we find a sense of individuals having to take responsibility for continually reconstituting themselves through their life span….. The curriculum might be understood as a set of more or less intentional strategies to produce – in each student – a set of subjectivities…but the required set of subjectivities (required for this supercomplex world) is unlikely to be made clear to higher education….. What is clear however are the essential features of performance namely - understanding (how do we develop the knowledge to learn?), self-identity (what are the unique set of qualities, abilities, attitudes, behaviours and beliefs that we bring to our engagements with the world?) and action (what repertoire of actions give us control over our own destiny?)' *(Barnett, 2000).*

That traditional forms of discipline-based higher education do prepare us for a complex changing world is undeniable, in so far as so many people are able to take on and be successful in rolls that are far removed from their initial disciplinary training. That we recognise we can do better is also undeniable, having spent the last two decades (since the expansion of UK HE in the late 1980's) trying to enhance the effectiveness of our curriculum in preparing students for the world of work. This point in time is merely the point at which we can take stock of the situation and think again about the most appropriate direction to travel.

Looking beyond higher education to the professional worlds to which most of our students aspire we can see the sorts of qualities, skills, dispositions, agencies, ways of knowing and being that are required through the study of professionals doing what they do in their work environments (eg Eraut 1994, 2007 and 2008, Raelin 2007, Dreyfus and Dreyfus 2005, Billett 2009). While higher education has always sought to prepare learners for these professional worlds, the challenge is embedded in the question 'can create even better educational designs that will enable learners to be better prepared for the sort of world we imagine in the future?'

The informational world has added its own complexity. Indeed one of the main reasons the world has become so complex is the volume, immediacy, availability, diversity and speed of producing information. We need information handling and processing skills that were just not necessary when I was developing myself to be a geologist in the early 1970's. The problem for higher education is that many of us have not been trained or acculturated into the 'prosumer' culture within which much of this information is produced and used. We have not grown up with the ways in which many young people engage with the new forms of media through which information flows and influences. This is one area of higher education where professional educators need to be led by more knowledgeable learners. Perhaps even more challenging is the disconnect between the 'scientific' way we produce, codify and acknowledge the production of information, knowledge and wisdom in academia and the way it is produced and used in the 'real world' outside academia.

Learning in and for a complex world

Of course humans have always had to deal with complexity (e.g. Figure 1) and we have become who we are because over and over again someone has mastered complexity and created wisdom that has then been incorporated into the social consciousness. Such wisdom is full of integrative (connected, synthetic, relational and experiential) learning and critical thinking and reasoning and our progress and success as human beings is dependent on continuously searching for and the growing of new wisdom while retaining and using the insights that have already been gained.

Figure 1 The human condition: understanding situations searching for better solutions, integrating information and knowledge, thinking with complexity and creating and sharing wisdom through the cultures we create and inhabit! Complex thinking must involve integrative learning (both cognitive and experiential) and applying such thinking to the solution of problems or the exploitation of opportunities. Source of drawing not known.
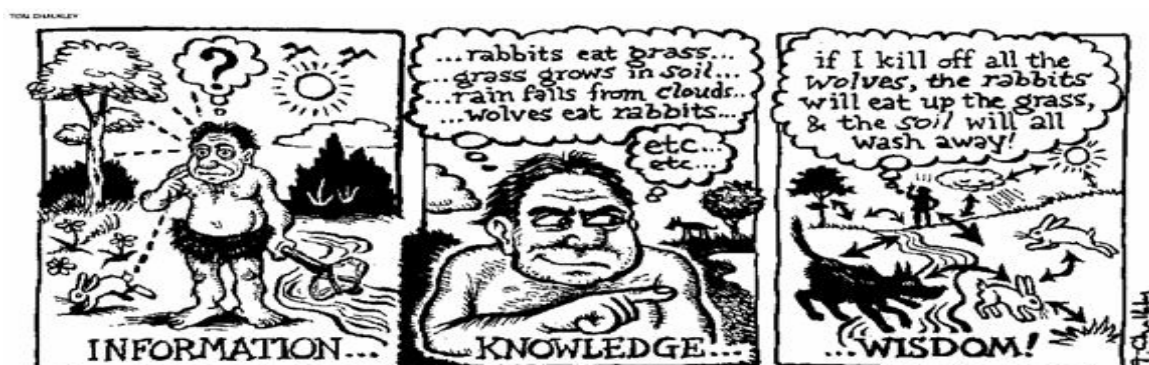
But the challenges of the modern world are not the same as they were twenty years ago and in twenty years time they will be significantly different again: the world is in a constant state of flux. We have to prepare students not just for the complexity they face here and now but lay the foundations for how they will deal with unknowable change and complexities they will have to grapple with thirty years from now. The challenge is to find the most effective and authentic ways of achieving this aim.

Symbolic representation of learning in and for a complex world

It is not easy to represent the sorts of learning we need to survive, prosper and feel a sense of fulfilment in this complex world. The following sections explore a range of perspectives on human forms of knowing and agency and convey the complexity of contexts which learners are simultaneously in (here an now) and are preparing themselves for in the future. The way we chose to convey some of the complexities of the learning, personal and professional development required to 'perform, invent and adapt' in an uncertain, ever changing and perpetually challenging world, was through a symbolic wall drawing (Figure 2).

At the heart of our concept is the notion of 'will' (Barnett 2005) the willingness to learn through the whole of life's experiences, the willingness to see self-development as a holistic and integrated process which evolves through participation in the opportunities that life affords.

Stephen Covey's expression of human agency (Covey 2004: 4) is relevant here. 'Between stimulus and response there is a space. In the space lies our freedom and power to choose our response. In those choices lie our growth and our happiness.' We would say in that the freedom to choose space includes involves decisions about who we want to be and become, for example the desire to be creative or enterprising, to behave ethically and with integrity, or to play an active or leading role in a community of interest or social network. In the context of this paper the question is, *how might new media contribute to this central goal of helping people discover who they want to be and help them develop that important sense of becoming?*

Figure 2 SCEPTrE's symbolic image of learner as the designer, creator and integrator of their own learning and experiences within which notions of man the knower, man the maker and man the player can be integrated. Any complex performance requires these integrative ways of thinking, doing and being.

In the context of this paper we are interested in the part new media / emerging technologies play in this complex world big picture, how new media facilitates communication, social interaction, and individual and collaborative learning, and the skills and literacies required to be an effective communicator and learner in the modern world.

Epistemology for a complex modern world

'Driscoll (2000) defines learning as "a persisting change in human performance or performance potential…[which] must come about as a result of the learner's experience and interaction with the world" (p.11). This definition encompasses many of the attributes commonly associated with behaviourism, cognitivism, and constructivism – namely, learning as a lasting changed state (emotional,

mental, physiological (i.e. skills) brought about as a result of experiences and interactions with content or other people' (Siemens 2005, 2006). Siemens goes on to discuss the limitations of behaviourism, cognitivism, and constructivism and to propose another theory of learning which he called *connectivisim*. 'Including technology and connection making as learning activities begins to move learning theories into a digital age. We can no longer personally experience and acquire learning that we need to act. We derive our competence from forming connections'. …'Learning (defined as actionable knowledge) can reside outside of ourselves (within an organization or a database), is focused on connecting specialized information sets, and the connections that enable us to learn more are more important than our current state of knowing'…. In today's environment, action is often needed without personal learning – that is, we need to act by drawing information outside of our primary knowledge. The ability to synthesize and recognize connections and patterns is a valuable skill (Siemens 2005).

From a learner perspective it is important to 'know where' such learning resides and 'know how' to connect to it in a timely and appropriate way. How learners understand the way they develop knowledge that is relevant to their needs and ambitions and the societies they live and work in, is of fundamental importance as we rethink our strategies for preparing them for future learning. 'Over the last twenty years, technology has reorganized how we live, how we communicate, and how we learn. Learning needs and theories that describe learning principles and processes, should be reflective of underlying social environments' (Siemens 2005). The question of learner epistemology in a modern world is of higher order significance than questions about pedagogy which should follow.

Knowledge and knowing

Baxter Magolda (1992 and 2001) identified four qualitatively different *ways of knowing*. These are:
- *Absolute knowing*: knowledge exists in an absolute form, it is either right or wrong
- *Transitional knowing*: knowledge is certain in some areas and uncertain in other areas
- *Independent knowing:* knowledge is uncertain. Everyone has their own beliefs
- *Contextual knowing*: knowledge is contextual. One judges on the basis of evidence in context.

If a learner only possesses a way of knowing that is absolute, then he or she is unlikely to cope well with problem-solving in conditions of uncertainty i.e. the real world. However, a student who possesses an independent way of knowing is likely to feel more confident, and be more effective, in such a situation. A student who has learnt in lots of different experience-based contexts will realize that knowledge, in real world problem working, is often strongly situated and contextual. A way of knowing is more than an academic cognitive skill that can be "developed" through carefully designed learning activities. It is firmly a part of who you are – your identity. In other words, changing one's way of knowing is to change as a person.

If we want to support the development of learners as integrative thinkers and performers who can develop and use knowledge that is relevant to a particular situation then we need to understand the epistemology that connects learning and practice (using the idea that practice is about people working on purposeful activity to achieve their goals regardless of whether they are studying or in a job).

The main problem with traditional higher education as a vehicle for preparing learners for the complexities of the world ahead of them is that it seems to take such a narrow view of what learning and knowledge is. Higher education is pre-occupied with codified knowledge and with its utilisation by learners in abstract hypothetical problem solving. This is not to say that handling complex information in this way is not useful – far from it: it is an essential process for enabling students to learn how to think about and work with complexity. If we adopt the idea of *work* as our overarching context for integrative learning and we take Michael Eraut's (2009) rich conception of personal knowledge we can gain a better understanding of the scope for the sources of knowledge that learners draw upon in a life-wide learning context.

> 'I argue (Eraut 2009:2) that personal knowledge incorporates all of the following:
> - *Codified knowledge* in the form(s) in which the person uses it
> - *Know-how* in the form of *skills and practices*
> - Personal *understandings of people and situations*
> - Accumulated *memories of cases* and episodic *events* (Eraut, 2000, 2004)

- Other aspects of personal *expertise*, *practical wisdom* and *tacit knowledge*
- *Self-knowledge*, *attitudes, values* and *emotions.*

The evidence of personal knowledge comes mainly from observations of performance, and this implies a *holistic* rather than *fragmented* approach; because, unless one stops to deliberate, the knowledge one uses is already available in an *integrated form* and ready for action.'

We are interested in exploring the potential of a life-wide curriculum that is rich in experiences for learning. Learning that is grounded in experience, especially when it is a rich, meaningful and immersive experience has the potential to contribute to all forms of learning identified by Marton et al (1983 p283-284) and most importantly, support development of the most elaborate forms of learning. Experience of working and learning in different environments is also essential to developing a repertoire of 'ways knowing' and 'being able to come to know'. Knowing is part of action and it lies at the heart of the epistemology of practice. It complements but is different to explicit and tacit knowledge and can only be gained through acts of doing and being (Cook and Brown 1999).

In the context of this paper, how does learners' use of new media within a life-wide curriculum contribute to the development of their understanding of these different forms of knowing and their conceptions of personal knowledge?

Man as knower, maker and player

Thomas and Seeley Brown (2009) offer a perspective that integrates these different dimensions of knowing and being and provide a useful commentary on the role of new media in the development of people who are able to cope with a world of constant and rapid change, and who are able to express themselves and be productive and fulfilled in this world.

They consider three basic domains of human behaviour which correspond to mind, body, and imagination and three kinds of practices: knowing, constructing and playing. These three domains of learning, correspond to three broader frames: *Homo Sapiens* (human as knower), *Homo Faber* (human as maker) and *Homo Ludens* (human as player). While the caricature above emphasises man the knower, man would not develop such knowing without him also engaging in making and playing.

'it is the combination of all three [behaviours] and their interaction within a social and participatory context that deserves critical attention. In what follows, we map out the affordances of these three fundamental domains and then provide a model for how we might understand their interactions in the networked world'

Thomas and Seeley Brown (2009) then go on to describe each domain of behaviour.

Homo Sapiens: "(hu)man as knower" is a fundamental statement about what it means to be human. It is also an ontological statement about learning. The past decade has ushered in substantial changes in how we think about what it means to learn, based primarily in the context of rapid change in our networked world. There are three senses in which learning happens in relation to change. The most basic sense is "learning about" which corresponds to contexts in which information is stable. We learn about things which are stable and consistent and not likely to change over time. The second sense is "learning to be," which requires engagement with an epistemic community and provides a sense of enculturation in practices which allow one to participate and learn how to learn and even shape practices within that community. The third sense, which emerges out of a context of rapid and continual change, is a sense of *becoming*. This sense of learning is itself always in a state of flux, characterized by a sense of acting, participating, and knowing.

The emergence of new media and the way it is used causes us to think more directly about what we mean by "knowing". New media provides a sense of agency. In an Internet based world, how we know things (e.g. what sources of information we give authority?) is become increasingly complicated. In a context where knowledge is ever shifting and in a process of continuous flow, how we know things (and how we know what we know?) has become more important to us than the factual status of information itself. In most areas of human activity, knowledge is both contingent and in flux. We expect "facts" to change on a continuing basis, because they are facts about a changing world and because we have a technological infrastructure that can support rapid updating of information without high material costs. This shift demonstrates an increasing importance to the context of information. Much of the 20th

century information infrastructure is focused on accuracy, the *what* of information. New media technologies, while not losing site of the *what*, force us to consider both the *where* (what is the authority behind the information) and the *when* (is the information current and relevant to my particular problem). This warranting of information signals, again, the importance of the tacit dimensions of knowledge, the things which cannot be rendered explicit, but which form a large part of the basis of what it is that we know. Equally important, these factors depend almost entirely on the social context of the information, which is also the driving force for shaping one's sense of becoming.

But beyond these considerations we also need to learn how to process and make sense of the information that is now available often almost instantaneously, in volumes, and with such diverse perspectives that is extremely difficult to manage. George Siemen's (2006) writes: 'We are now able, through an abundance of social tools, to produce and create content previously requiring a substantial investment. Broadcasting ideas—in text, audio, and video—is a fairly simple process. As a result, any issue can be explored and dissected form numerous angles. Even simple viewpoints can be complexified through the multiple viewpoints of the masses. While blogs, wikis, podcasts, and social bookmarking are receiving much attention, the real point of interest lies not in the tools themselves, but in what the growth of the tools represents and what the tools enable. Primary affordances include: (a) two-way flow, and (b) activities reflective of networked activities of individuals. Making sense of this complex conversation requires a shift to alternative models of management. It is at this stage that technology is beginning to play its greatest role; one that will continue to grow in prominence as knowledge grows in complexity. Learning, augmented by technology, permits the assimilation and expression of knowledge elements in a manner that enables understanding not possible without technology'.

Thomas and Seeley-Brown (2009), argue that while the traditional model of learning has been grounded in the concept of "learning about," the idea that knowledge is something to be studied and accumulated, new theories of learning have begun to understand the affordances in the networked world that privileges notions of "learning to be," the ability to put the things we learn into action, often within the context of an epistemic community and going further the development of a sense of becoming through the act of participation in a networked community of interest.

Homo Faber: is "(Hu)man as maker," stressing our ability to create. This is perhaps the most important and transformational elements of the networked world and provides a unique set of affordances for understanding the relationship between new media and learning. As new media has evolved it has increasingly tended toward providing agency to users, allowing them to creatively express themselves, often within a context that allows for commentary, feedback, and criticism. *Homo Faber* is more than simply making; it is making within a social context that values participation. It is akin to what Michael Polanyi (1967, 1974) has described as "indwelling," the process by which we begin to comprehend and understand something by connecting to it and, literally, living and dwelling in it. In that way, making also taps into the richness of becoming. We learn through making, building, and shaping not to produce something static, but to engage in the process of participation. In fact, we may go so far as to say, there can be no sense of becoming, particularly as it relates to learning, without the dimension of *Homo Faber* as indwelling.

Homo Faber, constitutes *knowing* as an embodied set of experiences that we create through our practices of being in the world and attending to things in the world through our experiences with them. To know something *deeply* is to understand the explicit dimension though our embodied engagement with its tacit dimension. New media opens up the possibility of this kind of deep knowing by providing the agency to participate, create and build, with the recognition that building is always being done within and also continually creating and remaking a social context. Most critically, within the context of a networked imagination, making is a creative process which shapes the social context in which the creation itself has meaning. In doing so, we can begin to see *Homo Faber* as creating an epistemology which is centred on *knowing and becoming*, rather than knowledge and being and which takes practices of fabrication, creation and participation as the cornerstones of learning. *Homo Faber* no longer divorces knowledge from knowing, or explicit from tacit understanding. Instead, *Homo Faber* invites us to think about the ways in which the two are inherently connected and supplemental to one another. Through creating we come to understand and comprehend the world, not merely as a set of object, artefacts, or creations, but as coherent entities which we come to dwell in and which we make sense of the "jointness" and interconnection of the parts that constitute the whole, both at the explicit level of the object itself and at the tacit level in terms of its social context and relations. It is this level of

tacit knowledge, that which is known, embodied and most importantly *felt* that begins to constitute a basis for a new understanding of learning.

Homo Ludens: "(hu)man as player," is perhaps the most important, yet overlooked, element of understanding our relationship to new media. Huizinga's (1950) thesis is that play is not merely central to the human experience; it is constitutive of all that is meaningful in human culture. Culture, he argues, does not create play; play creates culture. In almost every example of what he describes as the sacred, play is the central and defining feature of our most valued cultural rites and rituals. As such, for Huizinga, play is not something we do; it is who we are.

To truly understand the connection between play and learning, we need to fully grasp how play puts us in a different mindset. Play is a complex and complicated idea, which is usually held in opposition to most of what have been considered the most stable pillars of learning in the 20th century. Play is thought of as the opposite of work. It is fun, rather than serious. Its connection to learning is often seen as secondary or incidental.

Play is probably the most overlooked aspect in understanding how learning functions in culture. It is easy to identify spaces in which networked culture provides opportunities for play, video games being a clear example. But thinking about play as a cultural disposition, rather than as merely engaging with a game, reveals something more fundamental at work. Much of what makes play powerful as a learning environment is our ability to engage in processes of experimentation, which becomes the gateway to opening up the imagination. All systems of play are, at base, learning systems. They are ways of participating in complicated negotiations of meaning, interaction, and competition, not only for entertainment, but also for the making of meaning. Most critically, play reveals a structure of learning that is radically different from what most structured learning environments create, one which is almost ideally suited to the notions of flux and becoming outlined above. In play we are presented with yet a third perspective on learning in a world of constant flux. In the case of play, the process is no longer smooth and progressive, but is constituted by a gap between the facts or knowledge we are given and the end result or outcome we wish to achieve. This dynamic accelerates in the context of flux and rapid change, where stable paths and linear progression are no longer viable. What play provides is the opportunity to leap, to experiment, to fail and continue to play with different outcomes or to "riddle" one's way though a mystery. That leap that you take is more than simply a means to cross the chasm between what you know and what you want to achieve: it is an *organizing principle*. Figuring out a riddle is more than simply getting the right answer. It is an answer which organizes and makes sense of the riddle. In that sense, our understanding comes not from a linear progression, but, instead, by imagining the problem from all angles, but ultimately seeing its logic only at the end.

Riddles make sense only retroactively. That is the nature of an epiphany. An *epiphany* is more than an answer. It is a moment which throws all that has come before it into sharp relief, by making sense of a progression which may have seemed disorganized, dishevelled or even nonsensical up until the moment when some greater understanding is reached and its meaning is revealed *by* the player. And which couldn't happen without the playfulness of mind required to see things in a nonlinear or non-causal way.

Perhaps most critical in this sense of play is the way in which the sense of agency emerges. Where traditional notions of learning position the learner as a passive agent of reception, the *aporia* [state of being at a loss] / *epiphany* [sudden intuitive realisation] structure of play makes the agency of the player central to the learning process. How one arrives at the epiphany is always a matter of the tacit. The ability to organize and make sense of things is a kind of "attending to" characteristic of the tacit dimension.

The value of play is never found in a static endpoint, but instead in the sense that the player is always in a state of becoming. Whatever it is that one accomplishes in play, it is never about achieving a particular goal (even if a game may have an endpoint of end state). It is always about finding the next challenge or becoming more fully immersed in a state of play. What we do in play may best express the sense of becoming. This sense of play then provides us with a third, and very different, sense of learning. One which is neither about the process of learning to be, or an embodied sense of indwelling (though it may be consonant with either or both), but which is structurally different in how it organizes our understanding and comprehension of the world. In play, learning is not driven by a logical calculus

but, instead, by a more lateral, imaginative thinking and feeling. In sum, playing, like making and knowing, derives its power from the tacit dimension.

Importance of productive enquiry

If we are to develop learners who are able to appreciate that their personal knowledge is a combination of these different forms of knowledge and that they are capable of developing knowledge for a purpose and in different contexts, and that they integrate their learning drawing fro past experiences and adapting what they know to new situations, then HE has to give greater consideration and value to constructivist epistemology. This would recognise that integrative learning is at the heart of an individual's process of personal meaning making, and developing, acquiring and using knowledge to achieve particular purposes in particular contexts, and also co-creating knowledge for and through work, when working with other people.

So much of higher education is positivist in its approach to learning and about telling learners what we think they need to know in contrast to the rest of their lives where they usually have to determine what they need to know and find out for themselves. It is not by accident that we highlight in our symbolic image of learning for a complex world (Figure 2) the need for learners to be able to formulate good questions to guide their own learning and problem solving.

What is so significant about pedagogies for integrative learning (Klein 2005:3) is that:
'traditional teaching functions of telling, delivering, directing and being a sage on the stage are (substantially) replaced by the models of mentor, mediator, facilitator, coach and guide…..The process is constructivist at heart. Students are engaged in 'making meaning'. Applications of knowledge takes precedence over acquisition and mastery of facts alone, activating a dynamic process of question posing, problem posing, decision making, higher-order critical thinking and reflexivity. A set of core capacities emerge from the intersection of these two concepts:
- asking meaningful questions about complex issues and problems
- locating multiple sources of knowledge, information, and perspectives
- comparing and contrasting them to reveal patterns and connections
- acknowledging and negotiating their contradictions
- creating an integrative framework and a more holistic understanding.
- understanding issues and positions contextually.
- being able to use information by integrating into their existing knowledge and adapting it so that it can be used in other situations.'

Many of these core capacities for being an integrative learner can be related to the process of inquiry which John Dewey considered to be 'the controlled or directed transformation of an indeterminate situation into one that is so determinate in its constituent distinctions and relations as to convert the elements of the original situation into a unified whole.'   The idea of 'productive inquiry' (Dewey 1922 discussed by Cook and Brown 1999) lies at the heart of our symbolic learning for a complex world representation (Figure 2). The ability to pose and form good questions and be able to find things out in order to make good decisions about what to do is an essential capability to be developed if we are to help learners become integrative thinkers and doers.
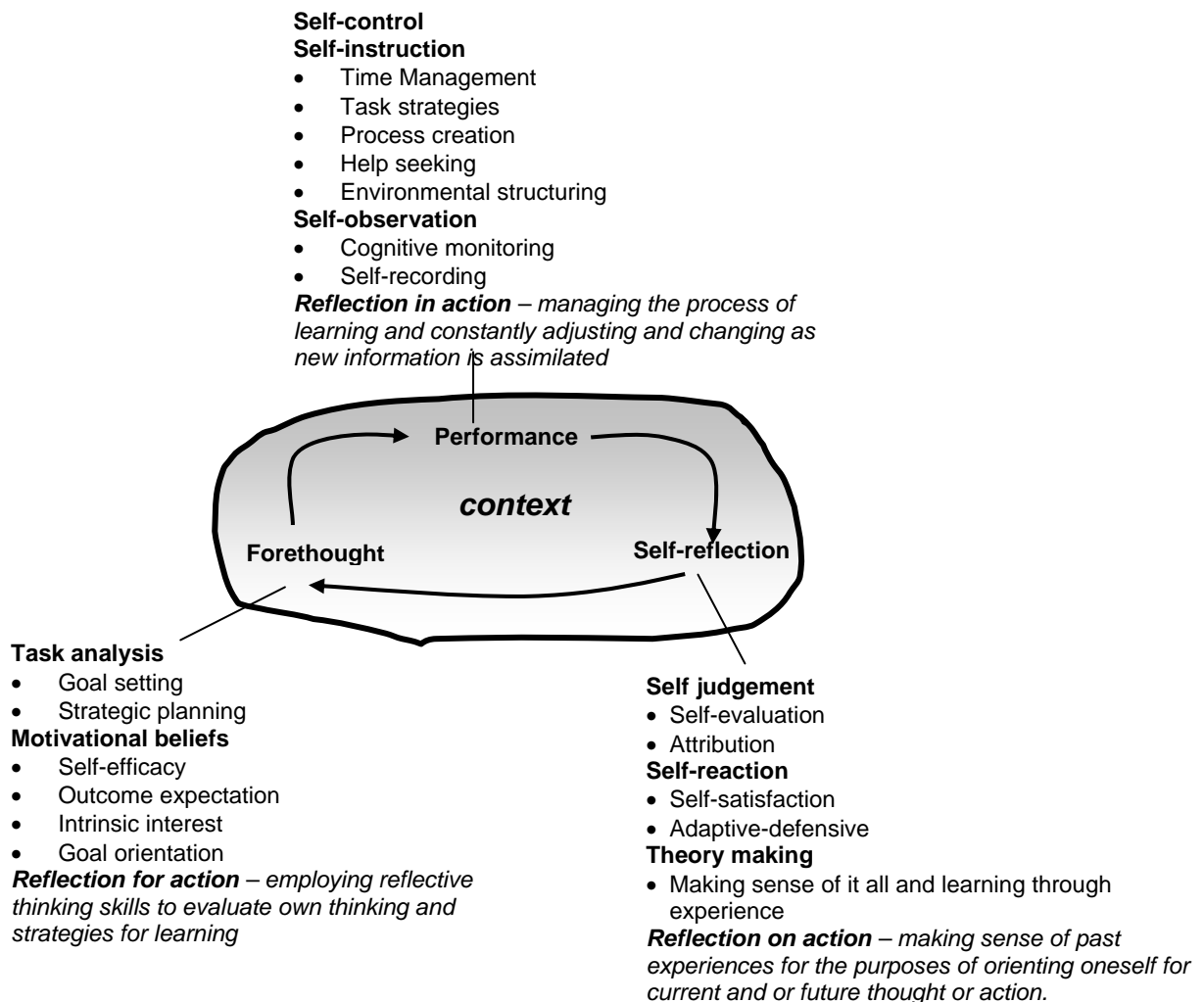
Productive inquiry is another unifying concept for integrative learning because it can be applied to all situations : from scientific investigations to situations that crop up in our daily lives. It is a capability we need in all working contexts. 'Productive inquiry is not a haphazard, random search; it is informed or disciplined by the use of theories, rules of thumb, concepts and the like. These tools for learning are what Dewey understands the term knowledge to mean and using knowledge in this way is an example of that form of knowing which Dewey called productive inquiry' (Cook and Brown 1999:62).

In the context of this paper, how does learners' involvement with new media help them develop the attitudes, questioning skills, use of tools and abilities to search for and find the information and knowledge they need and make productive use of this information?

At the heart of an individual's epistemological process is the space where they assess situations, recognise problems, challenges and opportunities, form questions and strategies to find out things so that they can make better decisions about what to do, make plans about what to do and then go and do it, all the time being aware of the effects of their actions and afterwards reflecting on their performance.

This is fundamentally a process of self-regulation as described by Zimmerman (2000) and others.

Figure 2 Model of self-regulated learning Zimmerman (2000 p. 226) coupled to notions of reflection Ertmer and Newby (1996).

Self-control
Self-instruction
- Time Management
- Task strategies
- Process creation
- Help seeking
- Environmental structuring

Self-observation
- Cognitive monitoring
- Self-recording

Reflection in action *– managing the process of learning and constantly adjusting and changing as new information is assimilated*

Performance

context

Forethought

Self-reflection

Task analysis
- Goal setting
- Strategic planning

Motivational beliefs
- Self-efficacy
- Outcome expectation
- Intrinsic interest
- Goal orientation

Reflection for action *– employing reflective thinking skills to evaluate own thinking and strategies for learning*

Self judgement
- Self-evaluation
- Attribution

Self-reaction
- Self-satisfaction
- Adaptive-defensive

Theory making
- Making sense of it all and learning through experience

Reflection on action *– making sense of past experiences for the purposes of orienting oneself for current and or future thought or action.*

Self-regulated learning involves self-determined processes and associated beliefs that initiate change and sustain learning in specific contexts (Schunk and Zimmerman 1998, Zimmerman 2000, Zimmerman and Schunk 2003). It is fundamentally linked to:
- metacognitive processes such as planning, organising, self-instructing, self-monitoring and self-evaluating one's efforts to learn;
- behavioural processes such as selecting, structuring, and creating environments for learning;
- processes and beliefs that motivate self-regulated people to learn – such as beliefs about their own capabilities to learn, beliefs that the outcomes of learning will be worthwhile, intrinsic interest in the task and satisfaction or dissatisfaction with their own efforts to learn.

Self-regulation can be represented as a continuous process involving forethought (planning and decision making) – performance – self-reflection on performance operating within a context specific environment that is structured by the learner to provide resources to enable them to achieve what it is they want to achieve (Figure 2). Self-regulation provides an explanation for the way learners acquire knowledge and make it their own and integrate their learning through the diverse experiences that make up their lives. The theory of learning connects and integrates thinking about, doing, being and becoming.

Concepts of self-regulation developed through empirical studies of students engaged in learning can be directly related to the processes through which professionals develop knowledge and learn through

work. Michael Eraut (Eraut 2007, 2009) defines the basic epistemology of practice in professional work situations as:

- *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.

This basic epistemology used by professionals to evaluate a situation – decide how to respond – do something and change what we do when we see and understand its effect – is also the basic epistemology we use in other areas of our lives where the onus is in us to decide what to do and act (like when students are confronted with an assignment that they have to complete). It seems reasonable to infer that we can develop and practice this epistemology through life experiences outside a professional work context (a learner's life-wide curriculum).

But being able to begin to engage with a situation and then follow through with appropriate actions requires capability, defined by Michael Eraut in terms of "what individual persons bring to situations that enables them to think, interact and perform" (Eraut 1997, 1998), and " it is everything that a person (or group or organisation) can think or do" (Eraut 2009 p6). Developing capability is a never ending (life-long and life-wide) story and it has both generic transferable dimensions and highly specific situated dimensions that may or may not be transferable. Being an integrative thinker and being able to integrate learning are important dimensions of capability for professional people. Michael Eraut has developed a concept of professional capability based on the learning trajectories he has witnessed when observing professionals working (Eraut 2009:5). SCEPTrE is attempting to develop tools from this model of capability to use as an aid for thinking about learning and capability within the award we are proposing (Willis 2009).

Personal Development Planning (PDP)

Helping learners develop deeper awareness and understanding of this fundamental epistemology of practice (learning for performance and learning through performance) and creating lots of opportunity for students to practise this way of developing personal knowledge and co-creating knowledge with others, is central to the way we are approaching integrative learning through our concept of life-wide learning through a life-wide curriculum. We need to embed these ideas of self-regulation and the spaces for students to exercise their choices and practice self- regulation into our educational designs and we are aided by the adoption in the UK of an approach to learning that is being promoted through a UK-wide policy called Personal Development Planning (PDP[4]).

PDP processes contain a set of interconnected activities (Jackson 2003) namely:
- thinking about and planning to do / achieve something;
- choosing a course of action
- doing something / acting on plans – learning through the experience of doing with greater self-awareness – and modifying improvising plans through the experience of doing;
- recording – thoughts, ideas, experiences, both to understand better and to evidence the process and results of learning;
- reviewing – reflections on what has happened, making sense of it all;
- evaluating – making judgements about self and own work and determining what needs to be done to develop/improve/move on;
- using – the personal knowledge and sense making derived from PDP to do something different and / or change behaviours or future actions

From this we can generate a process-based definition of PDP i.e. Approaches to learning that connect planning (specific goals for learning), doing (aligning actions to learning goals), improvising (because

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[4] QAA Guidelines http://www.qaa.ac.uk/academicinfrastructure/progressfiles/guidelines/pdp/ accessed December 28th 2009

we come to realize that some actions are better than others within a given situation), recording (self-evidencing learning), reflection (reviewing and evaluating learning and actions) and becoming more aware of self in the process.

Underlying this conceptualisation of PDP is the belief that it is helping to build self-identity, self-awareness and self-efficacy. But regardless of the rhetoric that surrounds PDP, the primary objective is to broaden the repertoire of students' skills and capabilities to learn so that they are able to:

- learn in a wider variety of ways and a wider range of contexts and be conscious of the way that they are learning;
- recognise, judge and evidence their own learning and the progress they are making;
- draw upon and use their expanded personal knowledge to achieve particular goal;
- review, plan and set new goals;
- action their learning in ways that are consistent with their planning: their planning being a source of energy and motivation;
- create new opportunities for themselves as a result of their new personal knowledge.

The learners own narrative of learning (knowing) and experiences of becoming can be represented through a variety of media for example diaries, journals, written stories, photographs, drawings, other artefacts, audio stories, digital stories, blogs, video clips on You Tube and more. Certain tools and spaces encourage the telling and archiving of these narratives for example institutional e-portfolios, institutional social networking spaces and wikis, and virtual spaces like YouTube, MySpace, FaceBook. and a hundred more.

We cannot stop the creativity of people in expressing themselves and creating meaning, but we can and often do in higher education make people use certain media (like VLE) rather than others. This is an important issue in the utilisation of new media: to what extent should we constrain the use of new media in enterprise which supports PDP in the context of life-wide learning?

At Surrey we are using e-portfolio as the tool of choice to support the recording and archiving of evidence of learning and achievement although other technologies may be used to demonstrate the learning and incorporated into or connected to the e-portfolio.

In the context of this paper, how does a learner's involvement with new media contribute to their development and practice in these self-regulatory and reflective dispositions and behaviours? And how can higher education make use of new media technologies to help learners structure reflect on, evaluate and represent their learning and personal – professional development?

Life-wide concept of curriculum

Our learning for a complex world image (Figure 2) provides us with a powerful metaphor for the integrated nature of human agency necessary to perform in the world. It is a visual metaphor for the way we as human beings engage in complex thinking and behaviour in response to the situations we encounter and how we utilise and integrate our learning (beliefs, values, knowledge, skills, dispositions, ways of being and experience) in order to perform in a complex world. **But what sort of curriculum will enable learners to develop the epistemologies, values and dispositions to engage with the informational, situational, relational and problem solving complexity they will encounter throughout their lives?**

  'For much of the 20th century, learning had focused on the acquisition of skills or
  transmission of information or what we define as "learning about." Then, near the end of
  the 20th century learning theorists started to recognize the value of "learning to be," of
  putting learning into a situated context that deals with systems and identity as well as the
  transmission of knowledge. We want to suggest that now even that is not enough.
  Although learning about and learning to be worked well in a relatively stable world, in a
  world of constant flux, we need to embrace a theory of *learning to become*. Where most
  theories of learning see becoming as a transitional state toward becoming something, we want to
  suggest that the 21st century requires us to think of learning as a practice of
 becoming over and over again' (Thomas and Seely-Brown 2009).

Our curriculum designs for undergraduate education are constrained by our provider/designer model of higher education. When faced with a curriculum design problem we usually begin with the content and academic skills that we believe as teachers it is important to master in our discipline. Sometimes, we choose a context like work and create a design to enable learners to learn through the work placement experience as well as the disciplinary context.

Implicit in the idea of learning for a complex world is the notion of people being the great integrators of learning from their own life-experiences with the ability to choose and the willingness and appetite to seize opportunity, adapt to and evolve in new situations. This notion of integration not only embraces what has gone before (the concept of life-long learning) but also what is happening in parallel during any stage of a person's life (our concept of life-wide learning). **If we want learners to see themselves as the architects and implementers of their own designs for their personal and professional development we need to change the paradigm that underlies our concept of curriculum.**

The idea that higher education is one component of a life-long process of learning is well established in educational policy and practice. The term *life-wide* learning was proposed by the author (Jackson 2008a and b, 2009) to highlight the fact that while a learner is engaged in higher education their life contains many parallel and interconnected experiences outside the academic curriculum that make a significant contribution to their personal and professional development. The term life-wide curriculum was proposed (Jackson 2008a and b) to highlight the potential for integrating learning from the combination of formal and informal learning experiences that a learner participates in during their higher education experience.

From an educational perspective, the most powerful argument for a life-wide curriculum (Figure 4) is that it contains more potential for participation and learning than any other curriculum! Adopting the idea of a life-wide curriculum changes the paradigm of what counts as learning, where learning occurs and why it occurs.

Figure 4 SCEPTrE's symbolic wall drawing representing the concept of life-wide learning through a life-wide curriculum
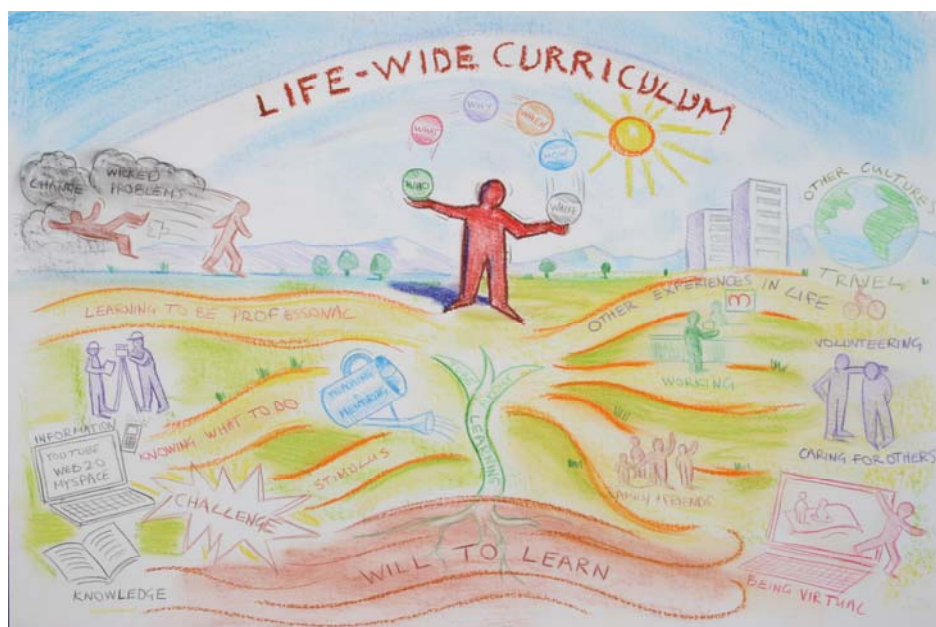
A life-wide curriculum shifts higher education into a more experience-based model of learning. The distinguishing feature of experience-based learning (Andreason et al 1995) is that the experience of the learner occupies central place in the learning process. This experience may comprise earlier events in the life of the learner, current life events, or those arising from the learner's participation in activities implemented by teachers and facilitators. A key element of experience-based learning is that learners analyse their experience by reflecting, evaluating and reconstructing it in order to draw meaning from it

in the light of prior experience. An experience-rich curriculum that engages with the full breadth of a learner's life provides an environment within which a more holistic conception of learning and individuals' sense of being and becoming in the world can be appreciated. We can appreciate much more (Beard and Wilson 2006) 'learning through being, doing, sensing, feeling, knowing and changing'. Experience of working and learning in different environments is essential to developing a repertoire of 'ways of knowing' and 'being able to come to know'. Experiential knowing is part of action and it lies at the heart of the epistemology of practice. It complements but is different to explicit and tacit knowledge and can only be gained through acts of doing and being (Cook and Brown 1999).

By reframing our perception of what counts as learning and developing the means of recognizing and valuing learning that is not formally assessed within an academic programme, we can help learners develop a deeper appreciation of how, what and why they are learning in the different parts of their lives. Heightened self-awareness is likely to help learners become more effective at learning through their own experiences and being an effective experiential learner should be an essential outcome of a university experience that prepares people for the complexities of an ever changing world.

Example design for encouraging, recognising and valuing life-wide learning

The University of Surrey has been committed to integrative learning from its inception in the 1960's when it adopted a model for its undergraduate education which sought to integrate disciplinary study and learning through year-long professional work placements. In adopting this approach the university believes that the outcomes from an undergraduate education are best served through educational designs and learning experiences that integrate campus and work-based contexts and require learners to integrate codified subject-based knowledge, self-study and 'experiential knowing' gained from performing professional roles in the real world. This has proved to be a powerful and successful educational model that gives our students the edge in the competitive employment market and the statistics for graduate employability show that over the last decade Surrey students consistently have the highest rate of employment six months after graduation. But the university has embarked on an ambitious plan to examine the feasibility to expand opportunity for integrative learning through the idea of a life-wide curriculum and a new Award that would recognise learning and achievements gained in contexts outside the academic curriculum.

Such an award would serve a number of purposes. The *common sense purpose* is to recognise and value learning and achievement gained outside the academic curriculum or professional training experience. There is significant pressure in the UK to prepare students for the world of work and the pragmatic purpose of such a framework is to encourage learners to develop a better understanding of the knowledge and skills they have gained from various experiences in order to be better prepared for presenting themselves to employers.

The *deeper purpose* which underlies both of these purposes is to provide opportunity for learners to practice using and developing the epistemology they will need when learning becomes the bi-product rather than the primary focus of work. The framework is designed to enable students to integrate their learning and experiences from different aspects of their lives notably University experiences, Work, Voluntary Service and experiences of Personal Choice (Figure 5)

A student entering the award scheme would be making a commitment to:
1) a sustained process of personal and professional development and integrative learning
2) a self-managed process taking responsibility for creating a personal & professional development plan and periodically reviewing progress within the framework of opportunities embraced by the Award Framework.
3) demonstrating learning and achievement in four Learning through Experience Certificates covering Life Skills, Work, Volunteering and an area of Personal Choice.
4) maintaining an e-portfolio to gather and store evidence of learning and achievement showing how skills that have been learnt and applied in a range of contexts.
5) participating in conversations about learning.
6) creating synthesising and integrating accounts of the learning and achievement gained through participating in the award.

Typically an undergraduate might engage with the award over about two years but this would be open to negotiation. The framework would allow students to integrate other qualifications into their achievement record to substitute for the University's Learning through Experience Certificates (for example nationally recognised certificates in Volunteering).

The **Life Skills Certificate** supports the self-managed planning, reviewing and integrative learning process. Within the framework of the Life-Skills Certificate participants:

- Are introduced to the Award though a workshop during which they prepare their initial personal and professional development plan and the technology to support their records of experiences, learning and achievement
- Engage with opportunities for life and employability skill development in line with their development plan, through the many opportunities available on- and off- campus recording and integrating their experiences, learning and achievement in their e-portfolio
- Periodically review their progress and refine their personal and professional development plans, integrating the learning and achievement they have demonstrated through their experience-based Work, Voluntary Service and Personal Choice Certificates.
- Synthesise and representation of learning, personal and professional development demonstrated through participation in the Life-Skills, Work, Volunteering and Personal Choice Certificates.

Achievement of the Life Skills Certificate is dependent on demonstrating an appropriate level of engagement with the process outlined above (recorded in the e-portfolio and personal development plans) and the evidence of learning demonstrated in the integrating accounts for the Life-Skills, Work, Volunteering and Personal Choice Certificates.

Figure 5 Provisional design for an award to support integrative learning that would expand our ability to recognise and value such learning beyond the current undergraduate model of education. It would also provide us with the means of recognising and valuing such learning for our undergraduate students.
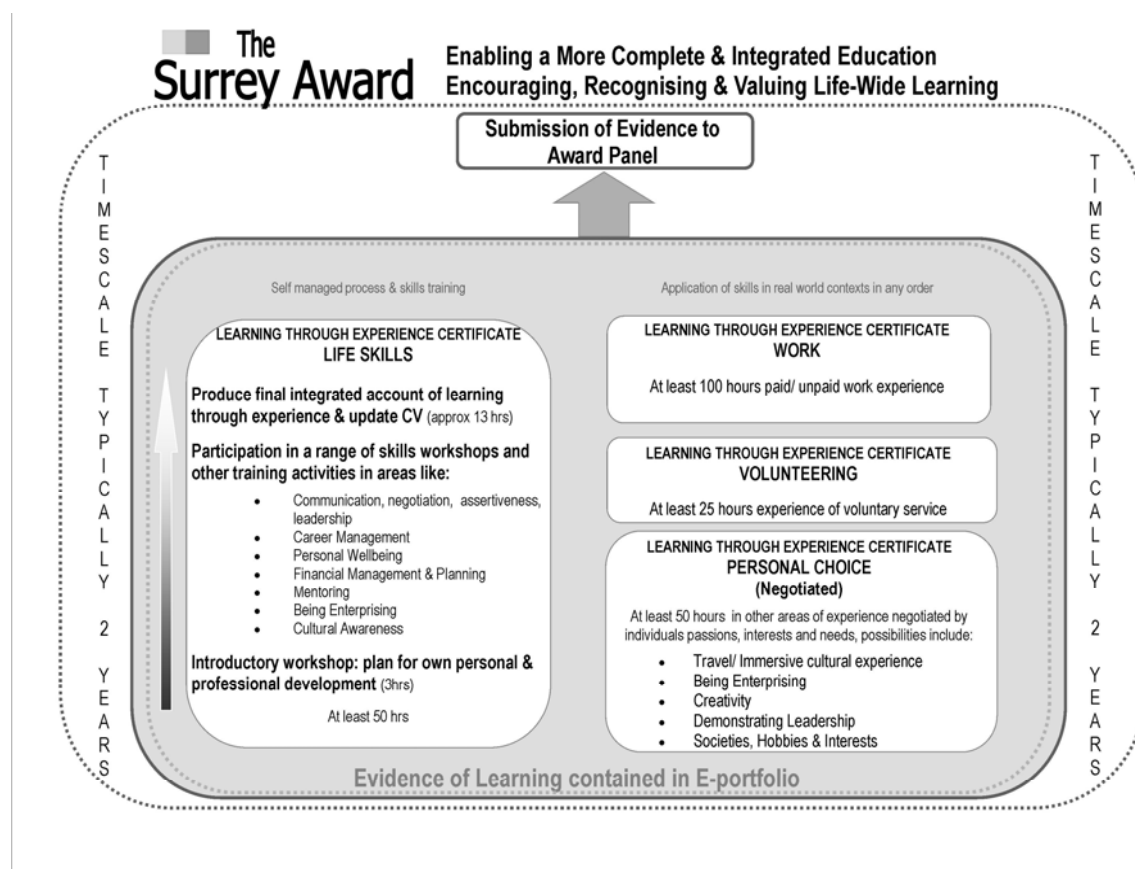
Learning through Experience Certificates

The fundamental pedagogy we are using is intended to promote responsible self-regulation (Jackson 2009) and productive inquiry described in the previous sections of this paper. We call this personal and professional development planning at Surrey.

In line with the student's overall development plan, the student will participate in one of the three contexts for learning (work, volunteering or personal choice). They create a learning agreement setting out the key expectations. They engage in their work and create a weekly entry in a blog or diary and their coach engages encourages them, through their comments, to think about their learning and the personal and professional development they are gaining.

Students are encouraged to reflect on their experiences through a tool that is being developed and evaluated based on Michael Eraut's Learning Trajectory model of professional capability Figure 7. We have developed a website to support reflective blogs and diaries (our shareexperience site) and adapted the software to enable students to categorise their blogs using the Michael Eraut capability framework, so that they can see and show that any story of an experience usually involves performance in several dimensions of the capability profile. This is a good way of helping students understand the integrative nature of the work-learning process.

We also use concept mapping to reveal changes in understanding (new learning) as a result of engaging in these work-learning processes. Towards the end of their experience students complete a questionnaire which provides the organisers with structured and systematic feedback on students self-reported learning and development and encourages the student to reflect further on their learning.

The final act in the integrative work-learning process is the production of a short synthesising account which enables the student to describe and evidence the learning, personal and professional development that has been significant to them.

PART 2

Life-wide Curriculum: new opportunities for media enabled learning

We have considered some of the important arguments developed by Jenkins et al (2006), Ito et al (2008) and Thomas and Seely Brown (2009) for why learners use of new media and their involvement in related social communities, can help develop forms of knowing, being and becoming that are essential to living in an information-rich, web enabled and media-mediated world.

> 'In a world of flux, knowing, making, and playing emerge as critical components of *becoming'*

> When we look to new media, we can begin to see social contexts in which knowing, constructing, and playing all start to emerge as central elements of learning and that the structure of learning within these new contexts are related to the interaction of these terms (Thomas and Seeley Brown 2009).

In Part 2 we examine some of the new media technologies and social interactions that new media affords. We identify ways in which higher education institutions might make use of some of these technologies to encourage, recognise and value learning and development gained through wider life-experiences and we also consider the emerging literacies and capabilities necessary for integrating these tools and ways of learning, being and becoming into the everyday lives of real people.

'The literacies that we need are not digital. THEY ARE HUMAN'

A important thought from Dave Cormier's Blog
http://davecormier.com/edblog/2009/12/05/eyes-shaded-we-walk-out-of-the-factory-there-is-no-more-button-to-push/

Scope of new media technologies

These propositions form a useful starting point for the examining the role and potential of new media in a curriculum that supports life-wide learning. But what sort of technologies are embraced by the term *new media?* According to wikipedia and webopedia new media is a generic term meant to encompass the emergence of digital, computerized or networked information and communication technologies. Most technologies described as "new media" are digital, often having characteristics of being manipulatable, networkable, dense, compressible, interactive and impartial. The term is intended to contrast "old" media forms, such as print newspapers and magazines that are static representations of text and graphics. It is impossible to define the list of technologies embraced by the term since these are continuously changing but examples include the internet, websites, email, computer multimedia, computer games and consols, CD-ROMS, and DVDs, digital cameras including video, streaming audio and video, online communities, chat rooms, virtual reality environments, integration of digital data with the telephone and internet videoconferencing. Data communication is happening between desktop, laptop computers and devices, such as PDAs, mobile phones, ipods/MP3, the media they take data from and the user(s). Ito et al (2008) use the term "new media" to describe 'a media ecology where more traditional media, such as books, television, and radio, are "converging" with digital media, specifically interactive media and media for social communication….. Current media ecologies often rely on a convergence of digital and online media with print, analog, and non-interactive media types. The moniker of "the new"… [is] situational, relational, versatile, and not tied to a particular media platform'.

Importance of Web 2.0 and participatory cultures

The term "**Web 2.0**" (2004–present) is commonly associated with web applications that facilitate interactive information sharing, interoperability, user-centered design and collaboration on the World Wide Web. Examples of Web 2.0 include web-based communities, hosted services, web applications, social-networking sites, video-sharing sites, wikis, blogs, mashups and folksonomies. A Web 2.0 site allows its users to interact with other users or to change website content, in contrast to non-interactive websites where users are limited to the passive viewing of information that is provided to them.

A recent report *Higher Education in a Web 2.0 World* (JISC 2009) highlighted the importance of Web 2.0 technologies and the need for higher education to engage more deliberately with the affordances offered by web 2.0 technologies and social interactions.

> 'Higher education has a key role in helping students refine, extend and articulate the diverse range of skills they have developed through their experience of Web 2.0 technologies. It not only can, but should, fulfil this role, and it should do so through a partnership with students to develop approaches to learning and teaching. This does not necessarily mean wholesale incorporation of ICT into teaching and learning. Rather it means adapting to and capitalising on evolving and intensifying behaviours that are being shaped by the experience of the newest technologies. In practice it means building on and steering the positive aspects of those behaviours such as experimentation, collaboration and teamwork, while addressing the negatives such as a casual and insufficiently critical attitude to information. The means to these ends should be the best tools for the job, whatever they may be. The role of institutions of higher education is to enable informed choice in the matter of those tools, and to support them and their effective deployment'.

New forms of participatory culture created interaction with new media

The utilisation of new media in a strong social context has given rise to what Jenkins et al (2006) describe as a *participatory culture* with 'relatively low barriers to artistic expression and civic engagement, strong support for creating and sharing one's creations, and some type of informal mentorship whereby what is known by the most experienced is passed along to novices. A participatory culture is also one in which members believe their contributions matter, and feel some degree of social connection with one another (at the least they care what other people think about what they have created). Forms of participatory culture include:

Affiliations — memberships, formal and informal, in online communities centred around various forms of media, such as Friendster, Facebook, message boards, metagaming, game clans, or MySpace).

Expressions — producing new creative forms, such as digital sampling, skinning and modding, fan videomaking, fan fiction writing, zines, mash-ups.
Collaborative problem-solving — working together in teams, formal and informal, to complete tasks and develop new knowledge such as through *Wikipedia*, alternative reality gaming, spoiling.
Circulations — Shaping the flow of media (such as podcasting, blogging).

In an important ethnographic study Ito et al (2008) constructed a typology of practices describing young people's participation in the social communities that are created around some forms of new media – which they defined as "hanging out," "messing around," and "geeking out." Thomson and Seely Brown (2009) believe that these three practices frame a (potential) progression of learning that is endemic to digital networks with each level of participation producing a richer sense of learning. They argue –

Knowing: Hanging Out: At the most basic level, participation in digital environments requires a sense of *knowing*, of "learning to be." As Ito argues, "participation in social network sites like MySpace, Facebook and Bebo (among others) as well as instant and text messaging, young people are constructing new social norms and forms of media literacy in networked public culture that reflect the enhanced role of media in young people's lives." Digital networked environments provide not only an extension of real-world interaction; they provide an enhanced environment for sharing information and engaging in meaningful social interaction. This notion of hanging out is what we see as the beginning of and essential to the process of indwelling. But the notion of indwelling, as Polanyi makes clear is much richer than simply having a feeling of presence or belonging. It goes beyond the process of enculturation and understanding of social norms, roles, and mores. The beginnings of indwelling in the digital world are rooted in the notion of "being with." What the Ito et al study reveals is that hanging out is more than simply gaining familiarity with the tools, spaces, and affordances of the digital. In fact, it is probably not an exaggeration to say it is not about the digital at all. Hanging out is about learning how to be with others in spaces which are mediated by digital technology. Again, in this notion we find learning that applies to the digital world, but which is also building a foundation for learning that transcends the bounds of the virtual. Hanging out, we contend, begins to develop the first aspect of indwelling: experience. That experience is governed by a central question: What is my relationship to others?

Playing/Knowing: Messing Around : The second notion of participation explored by Ito et al is messing around: "When messing around, young people begin to take an interest in and focus on the workings and content of the technology and media itself, tinkering, exploring, and extending their understanding." Within this framework, we begin to see a second dimension emerge, one which not only engages a second frame of reference, playing, but which begins to bring the two frames of reference into contact with one another. The function of play, above all else, is to problematize the familiar….For some users in digital environments, hanging out leads to the next stage which is characterized as "open ended," "self-taught," and "loosely goal directed." That moment causes a shift in perspective, where the process of knowing is no longer about our relationship to others, but instead becomes about understanding our relationship to the environment.

What we see as critical in this second stage is the shift in agency that occurs. Where hanging out is about acquiring a sense of social agency, figuring out how to use technology to maintain or enhance social relationships, messing around is about the user's relationship with the technology or environment itself. In hanging out, that relationship is easy to assess. Digital media are tools to facilitate social interaction. Their function is purely instrumental. The transition to messing around, as Ito describes it, is typically personal and involves the development of a sense of personal agency: "what is characteristic of these initial forays into messing around is that youth are pursuing topics of personal interest. In our interviews with young people who were active digital media creators or deeply involved in other interest-driven groups, they generally described a moment when they took a personal interest in a topic and pursued it in a self-directed way."

This process, we would describe as moving from experience to embodiment, where the personal investment in digital media changes the focus from social agency to personal agency. Technology and digital media begin to be viewed as an extension of the self. Not surprisingly, most of the introductions to messing around involve things that are heavily connected to personal identity, such as personal videos and pictures, MySpace profiles, and gaming activity that is about player modification.

What messing around reveals most fundamentally is that the relationship between us and our environment is rich, complex and changing. Our process of knowing is no longer instrumental; it is

instead structured by a sense of play. As a result, understanding our relationship to our environment requires experimentation, play, and riddling. That subtle shift transforms our experience into a set of tools for understanding the environment.

Playing serves as a frame of reference to problematize the familiar and the "play" we have in our own experience invites us to think through the possibilities of altering, shifting, and experimenting with the things we know as ready-at-hand. The kind of tinkering that characterizes messing around is not instrumental, it is not intended to find solutions or make things work better. It is, instead, focused on helping us understand who we are in relationship to our environment.

Messing around constitutes the next step of indwelling: embodiment. In doing so, it asks the question: What is my relationship to the environment?

Playing/Knowing/Making: Geeking Out: The final stage of participation, "geeking out," is the most complicated. Within our framework, there are two aspects of "geeking out" that merit particular attention. First, the conditions under which geeking out occurs, the technological infrastructure that makes it possible: "For many young people, the ability to engage with media and technology in an intense, autonomous, and interest-driven way is a unique feature of the media environment of our current historical moment. Particularly for kids with newer technology and high-speed Internet access at home, the Internet can provide access to an immense amount of information related to their particular interests, and can support various forms of geeking out."

Second, and the most critical aspect of geeking out is the manner in which it extends both the social agency of hanging out and the personal agency of messing around: "Geeking out involves learning to navigate esoteric domains of knowledge and practice, and participating in communities that traffic in these forms of expertise." It is the richness of experience and social agency produced by hanging out, the sense of embodiment and personal agency created by messing around combined with the third frame of reference, *making*, that produces what we think is the ultimate goal of indwelling: learning. Geeking out provides an experiential, embodied sense of learning within a rich social context of peer interaction, feedback, and knowledge construction enabled by a technological infrastructure that promotes "intense, autonomous, interest driven" learning [and production].

It is the third frame of reference, the making, which values understanding joint work, including the ways in which the community functions of hanging out and the personal functions of messing around can be harnessed and compounded to produce the "specialized knowledge networks" and "Internet-base communities and organizations." The learning taking place at the nexus of knowing, making, and playing, and making, is radically different from any learning environment we have seen before. It is an environment that emerges from a sense of indwelling, embodiment, and agency. As a result, it is a learning environment that gains almost all of its power and benefits from the tacit dimension.

New literacies and capabilities developed through new media/participatory cultures

A growing body of scholarship suggests (Jenkins et al 2006) potential benefits of these forms of participatory culture, including opportunities for learning about learning (as outlined above), a changed attitude toward intellectual property, the diversification of cultural expression, the development of skills valued in the modern workplace, and a more empowered conception of citizenship. Access to this participatory culture functions as a new form of the hidden curriculum, shaping which youth will succeed and which will be left behind as they enter school and the workplace.

New media literacies area a set of cultural competencies and social skills that young people need in the new media landscape. Participatory culture shifts the focus of literacy from one of individual expression to community involvement. The new literacies almost all involve social skills developed through collaboration and networking. These skills build on the foundation of traditional literacy, research skills, technical skills, and critical analysis skills taught in the classroom. They include (Jenkins et al 2006):

Play — the capacity to experiment with one's surroundings as a form of problem-solving
Performance — the ability to adopt alternative identities for the purpose of improvisation and discovery
Simulation — the ability to interpret and construct dynamic models of real-world processes
Appropriation — the ability to meaningfully sample and remix media content
Multitasking — the ability to scan one's environment and shift focus as needed to salient details.

Distributed cognition — the ability to interact meaningfully with tools that expand mental capacities
Collective intelligence — the ability to pool knowledge and compare notes with others toward a common goal
Judgment — the ability to evaluate the reliability and credibility of different information sources
Transmedia navigation — the ability to follow the flow of stories and information across multiple modalities
Networking — the ability to search for, synthesize, and disseminate information
Negotiation — the ability to travel across diverse communities, discerning and respecting multiple perspectives, and grasping and following alternative norms.

To which we might add confidence: confidence to try things out, learn from others and show/teach others.

In a recently published JISC-funded study Beetham et al (2009) identified a number of challenges and pinch-points to the development of learners' digital and learning literacy, some of which might be addressed through a strategy that embraced the concept of life-wide learning through a life-wide curriculum.

- Learners' information literacies are relatively weak but learners have little awareness of the problem
- There is poor support for learners' developing strategies to make effective use of technologies for learning, and in some institutions there are still barriers to use of personal technologies and social networks
- Learners require intensive support in migrating to more ICT-based study practices, particularly at transition points such as course selection, induction, final year preparation, move to post-graduate study
- Many learners lack general critical and research skills: 'digital scholarship' is poorly communicated and modelled in many subject contexts
- Learners' different approaches, attitudes and experiences of technology represent a new form of diversity which institutions must address to ensure equity of access
- Most learners use only basic functionality and are reluctant to explore the capabilities of technology
- Most learners are still strongly led by tutors and course practices: tutor skills and confidence with technology are therefore critical to learners' development
- There is a potential clash of academic/internet knowledge cultures, emerging particularly around issues of plagiarism, assessment, and originality in student writing.
- Students are often dissatisfied with the feedback and assessment process, and it is rarely used as an opportunity to further the development of self-awareness and literacies of learning
- There is often insufficient opportunity and motivation for learners to integrate literacies in authentic tasks
- Tutors are still insufficiently competent and confident with digital technologies for learning, despite evidence that learners are strongly influenced by their example
- Institutions need to respond to external agendas such as European harmonisation, the demand for higher skills, and demographic shifts in the learning population

Beetham et al (2009) nested their recommendations for communication, media and ICT literacies within a broad framework of capabilities for learning in a digital age (Table 1). I would argue that all of these capabilities could be supported through a life-wide curriculum.

Table 1 Summary of the LLiDA '**Framework of Frameworks**' for analysing the components of digital and learning literacy Beetham et al (2009)

High-level terms, framing ideas	Component competences
Learning to learn, metacognition	Reflection, Strategic planning, Self-evaluation, Self-analysis, Organisation (time, etc.)
Academic practice, study skills	Comprehension, Reading/apprehension Organisation (knowledge) Synthesis Argumentation Problem-solving Research skills Academic writing Specific subject discipline skills as appropriate
Information literacy	Identification, Accession, Organisation, Evaluation Interpretation, Analysis, Synthesis, Application
Communication and collaboration skills	Teamwork Networking 'Speaking' and 'listening' skills (see below for different media)
Media literacy (also 'visual' and 'audio' and 'video' literacies)	Critical 'reading' Creative production
ICT/digital/computer literacy	Keyboard skills Use of capture technologies Use of analysis tools Use of presentation tools General navigation/UI skills Adaptivity Agility Confidence/exploration

Employability	Self-regulation, Teamworking, Problem solving, Business and customer awareness, Innovation/enterprise
Citizenship	Participation and engagement, Ethicality/responsibility Political, social, personal responsibility

Engaging learners' : possible relationships of a life-wide curriculum/award framework to learners' involvement with new media technologies

There are two ways in which an institution might view the relationship between a life-wide curriculum and award framework and the forms of learning and participation engendered through learners' active engagement with new media.

The first position is that a life-wide curriculum/award framework acknowledges that some learners are actively engaged in learning and participation involving new media and recognises and values these forms of learning through appropriate mechanisms. Such a framework would encourage learners to determine for themselves the value and significance they place on these forms of learning and participation.

The second position sees these forms of learning and participation as an essential preparation for a life-time of working in an informational world that can only get even more complex and making them core capabilities/outcomes of an award framework that supports learning for a complex world. Such a position would be saying to learners that as an institution concerned with preparing you for a rapidly changing, information-rich world you should be investing in your own future by being actively involved in these forms of learning and participation.

Contexts for using new media in a life-wide curriculum

There are two main contexts within which the potential of new media to encourage and support life-wide learning might be considered. Firstly, the creation and animation of designs that deliberately set out to support life-wide learning might be construed as a form of work in the sense of encouraging purposeful activity directed towards a useful outcome i.e. the production of learning and personal and/or professional development. In this context we are interested in the specific affordances of new media that encourage and facilitate the sorts of learning and development we are trying to recognise and value through our educational designs, for example those forms of learning and self-expression that are embodied in the generic outcomes for our life-wide learning award. But we also recognise that the utilisation of new media occurs spontaneously within a culture of participation where the purposeful activity is not extrinsically driven by education as a form of work, but is intrinsically motivated and directed to play and social interaction where learning is not necessarily an explicit goal but is an implicit and useful bi-product. These forms of learning and practice are considered (Jenkins et al 2006 and Thomas and Seeley-Brown 2009 and above) as being essential for successful and fulfilled participation in a modern world. The concept and practice of life-wide learning affords the opportunity to embrace both of these dimensions of activity and recognise and value learning and personal development gained through learners' participation in such activities.

Questions for creative and productive enquiry

The paper is not intended to be complete. In the spirit of collaborative learning and co-production the paper is offered in both word format on the **life-wide learning wiki** so that you can add your own practice examples, ideas, opinions and URL links to other interesting and relevant work. Please make your additions in colour font and send them to the author norman.jackson@surrey.ac.uk for integration into the revised paper. All contributions will receive full acknowledgement in the paper.

Generative questions:
- **How can we enhance students' learning experiences and their preparedness for learning in a complex world through the utilisation of new media and the participatory cultures associated with these forms of communication and social interaction?**

- **How can I create new designs that will contribute to the development of learners' new media literacy skills and capabilities, within the framework of a life-wide curriculum?**

Dedication and acknowledgements

I am a dinosaur when it comes to knowing about and using the wealth of technology that is available to me. I have been partially saved from this blissful state of ignorance by my children and the CoLab students who work in our Centre. These students don't just engage with new media, they create through the adaptation of open source software, new media for themselves and others. I'd like to dedicate this ideas paper to the young people who are leading us into this new media-rich. I am also grateful to Andrew Middleton and Nicola Avery for their many suggestions that helped improve the initial draft of this ideas paper.

Additional information
http://lifewidelearning.pbworks.com/ - provides information about our development work
http://learningtobeprofessional.pbworks.com/ - the learning to be professional context for our work

Comments and examples welcomed by the principal author
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Appendix 1 A few examples of Web 2.0 technologies many of which encourage/facilitate participatory cultures which could be embraced through a life-wide curriculum. Readers are invited to add to the list of new media technologies. Source : wikipedia accessed on December 27- 30 2009

Blogs a type of website, usually maintained by an individual with regular entries of commentary, descriptions of events, or other material such as graphics or video. Many blogs provide commentary or news on a particular subject; others function as more personal online diaries. A typical blog combines text, images, and links to other blogs, Web pages, and other media related to its topic. The ability for readers to leave comments in an interactive format is an important part of many blogs. Most blogs are primarily textual, although some focus on art (Art blog), photographs (photoblog), videos (Video blogging), music (MP3 blog), and audio (podcasting). Microblogging is another type of blogging, featuring very short posts.

Blog search engines Several blog search engines are used to search blog contents. *Bloglines, BlogScope, and Technorati. Technorati,* among the most popular blog search engines, provide current information on both popular searches and tags used to categorize blog postings.

Blog software is designed to simplify the creation and maintenance of weblogs. As specialized content management systems, weblog applications support the authoring, editing, and publishing of blog posts and comments, with special functions for image management, web syndication, and moderation of posts and comments. Many weblog applications can be downloaded and installed on user systems. Some of them are provided under a free-software or open-source licenses, allowing them to be used, modified, and redistributed freely. Others are proprietary software which must be licensed.

Examples of open source software which can be downloaded and customised on a user's own platform
Apache Roller; b2evolution; blosxom; Django; Dotclear; DotNetNuke; Drupal; Frog CMS; Elgg; Habari ; HelixBlog ; Jaws ; Joomla! ; Livejournal ; LifeType ; Movable Type ; Nooto ; Nucleus CMS ; People Aggregator ; PivotX ; Serendipity ; SimpleLog Slash ; Subtext ; Textpattern ; Thingamablog ; Typo ; WordPress ; Postview

Blog service providers: weblog applications are offered only through their developers' hosts, either free of charge or for a fee. Services are typically limited to hosting of the blog itself, but some services offer the option of using the hosted software to update a blog published elsewhere.

Facebook http://www.facebook.com/ the most popular free social networking website. Users can add friends and send them messages, and update their personal profiles to notify friends about themselves. Additionally, users can join networks organized by city, workplace, school, and region. The website's name stems from the colloquial name of books given at the start of the academic year by university administrations with the intention of helping students to get to know each other better.

Twitter http://twitter.com/ a free social networking and micro-blogging service that enables its users to send and read messages known as *tweets*. Tweets are text-based posts of up to 140 characters displayed on the author's profile page and delivered to the author's subscribers who are known as *followers*. Senders can restrict delivery to those in their circle of friends or, by default, allow open access. Users can send and receive tweets via the Twitter website, Short Message Service (SMS) or external applications. While the service itself costs nothing to use, accessing it through SMS may incur phone service provider fees. The 140-character limit on message length was initially set for compatibility with SMS messaging, and has brought to the web the kind of shorthand notation and slang commonly used in SMS messages. The 140 character limit has also spurred the usage of URL shortening services such as bit.ly, goo.gl, and tr.im, and content hosting services, such as Twitpic and NotePub to accommodate multimedia content and text longer than 140 characters. Twitter invites users for status updates using the question "What's happening?" Twitter is ranked as one of the 50 most popular websites worldwide by Alexa's web traffic analysis. Twitter is the third most used social network

Skype is a software application that allows users to make voice calls over the Internet. Calls to other users of the service and, in some countries, to free-of-charge numbers, are free, while calls to other landlines and mobile phones can be made for a fee. Skype allows users to communicate by both voice and more traditional textual instant messaging. Voice chat allows both calling a single user and conference calling. It uses a proprietary codec. Skype's text chat client allows group chats, emoticons, storing chat history, offline messaging and (in recent versions) editing of previous messages. The usual gamut of features familiar to instant messaging users - such as user profiles, online status indicators, and so on - is also included. Additional features include instant messaging, file transfer and video conferencing.

Netvibes http://www.netvibes.com/ a multi-lingual personalized start page or personal web portal much like Pageflakes, My Yahoo!, Alot.com, iGoogle, and Microsoft Live. It is organized into tabs, with each tab containing user-defined modules. Built-in Netvibes modules include an RSS/Atom feed reader, local weather forecasts, a calendar supporting iCal, bookmarks, notes, to-do lists, multiple searches, support for POP3, IMAP4 email as well as several webmail providers including Gmail, Yahoo Mail, Hotmail, and AOL Mail, Box.net web storage, Delicious, Meebo, Flickr photos, podcast support with a built in audio player, and several others. A page can be personalized further through the use of existing themes or by creating your own theme. Customized tabs, feeds and modules can be shared with others individually or via the Netvibes Ecosystem. For privacy reasons, only modules with

publicly available content can be shared. Netvibes supports podcasts with built in audio player. The Netvibes Ecosystem is a collection of user submitted modules/widgets built using Netvibes Universal Widget API (UWA

YouTube http://www.youtube.com/ a video sharing website on which users can upload and share videos. Three former PayPal employees created YouTube in February 2005. It is now operated as a subsidiary of Google. The site uses Adobe Flash Video technology to display a wide variety of user-generated video content, including movie clips, TV clips, and music videos, as well as amateur content such as video blogging and short original videos. Most of the content on YouTube has been uploaded by individuals.

Flickr http://www.flickr.com/ an image and video hosting website, web services suite, and online community. In addition to being a popular website for users to share and embed personal photographs, the service is widely used by bloggers to host images that they embed in blogs and social media.[1] As of October 2009, it claims to host more than 4 billion images

Animoto http://animoto.com/create is a web application that produces videos from user-selected photos, video clips and music. Animoto analyzes the provided photos, video clips and music, automatically generating a movie trailer-like video with them. According to the website, every nuance of the song is analyzed, producing a completely unique video every time. The site also claims that no two videos are ever the same.

Glogster http://www.glogster.com/ is a social network that allows users to create free interactive posters, or glogs. Glogster provides an environment to design interactive posters. The user inserts text, images, photos, audio (MP3), videos, special effects and other elements into their glogs to generate a multimedia online creation. Glogster is based on flash elements. Posters can be shared with other people. Glogs can also be exported and saved to computer-compatible formats.Each visitor can integrate dynamic multi-sensory resources into traditionally text-oriented tasks.

BBC Blast http://www.bbc.co.uk/blast/ a website that supports a network of creative teenagers. The Blast website is a destination for young people to upload their artwork and general creativity, grouped under the projects main headings of art and design, dance and drama, fashion, games, music, and writing. Users can upload their work, and comment on and rate other people's. The website also has a safely moderated forum for users to interact about their creativity, and even talk to Blast Creative Trainees. Furthermore, the website is the hub for booking workshops on the Blast Tour, and finding some of the content that was produced there. Although, the website specifically caters for 13 to 19 year olds, the BBC Blast project also runs a variety of work experience schemes for young adults between the ages of 18 to 25, who are just taking their first steps into the creative industries.

Wikipedia http://en.wikipedia.org/ a free, web-based, collaborative, multilingual encyclopedia project supported by the non-profit Wikimedia Foundation. Its name is a portmanteau of the words *wiki* (a technology for creating collaborative websites, from the Hawaiian word *wiki*, meaning "quick") and *encyclopedia*. Wikipedia's 14 million articles (3.1 million in English) have been written collaboratively by volunteers around the world, and almost all of its articles can be edited by anyone with access to the site.

Wikis are websites that allows the easy creation and editing of any number of interlinked web pages via a web browser using a simplified markup language or a WYSIWYG text editor. Wikis are typically powered by wiki software and are often used to create collaborative websites, to power community websites, for personal note taking, in corporate intranets, and in knowledge management systems. **Wiki Matrix** http://www.wikimatrix.org/ provides a service that enables comparisons to be made between the many wikis that are available.

Zimbio http://www.zimbio.com/ an online magazine publisher that allows users to build interactive "wikizines", or web magazines, on whatever topic they choose. It also sup[ports citizen journalism. The site commonly covers headlines in entertainment, style, current events, and more. Zimbio has also launched "Zimbio TV" that features various videos from very popular TV series and syndicated shows. Zimbio is one of the fastest growing community sites on the internet.

OhmyNews (citizen journalism) a South Korean online newspaper website with the motto "Every Citizen is a Reporter". Founded on February 22, 2000. It is the first of its kind in the world to accept, edit and publish articles from its readers, in an open source style of news reporting. About 20% of the site's content is written by the 55-person staff, while most of the articles are written by other freelance contributors who are mostly ordinary citizens.

StumbleUpon an Internet community that allows its users to discover and rate Web pages, photos, and videos. It is a personalized recommendation engine which uses peer and social-networking principles. Web pages are presented when the user clicks the "Stumble!" button on the browser's toolbar. StumbleUpon chooses which Web page to display based on the user's ratings of previous pages, ratings by his/her friends, and by the ratings of users with similar interests. Users can rate or choose not to rate any Web page with a thumbs up or thumbs down, and clicking the Stumble button resembles "channel-surfing" the Web. StumbleUpon also allows their users to indicate their interests from a list of nearly 500 topics to produce relevant content for the user.[4] There is also one-click blogging built in as well.

Yahoo! Answers a community-driven question-and-answer (Q&A) site launched by Yahoo! on July 5, 2005 that allows users to both submit questions to be answered and answer questions asked by other users. The site gives members the chance to earn points as a way to encourage participation and is based on Naver's Knowledge iN. Yahoo! Answers is available in 12 languages, but several Asian sites operate a different platform which allows for non-Latin characters. On December 14, 2009 Yahoo! Answers announced 200 million users worldwide.

Delicious a social bookmarking web service for storing, sharing, and discovering web bookmarks It has more than five million users and 150 million bookmarked URLs.Delicious uses a non-hierarchical classification system in which users can tag each of their bookmarks with freely chosen index terms (generating a kind of folksonomy). A combined view of everyone's bookmarks with a given tag is available; for instance, the URL "http://delicious.com/tag/wiki" displays all of the most recent links tagged "wiki". Its collective nature makes it possible to view bookmarks added by similar-minded users. Delicious has a "hotlist" on its home page and "popular" and "recent" pages, which help to make the website a conveyor of internet memes and trends.

Digg is a social news website made for people to discover and share content from anywhere on the Internet, by submitting links and stories, and voting and commenting on submitted links and stories. Voting stories up and down is the site's cornerstone function, respectively called *digging* and *burying*. Many stories get submitted every day, but only the most *Dugg* stories appear on the front page. Digg's popularity has prompted the creation of other social networking sites with story submission and voting systems[.]

Massively multiplayer online games use the Internet to allow hundreds of thousands of players to play the same game together. Many different styles of massively multiplayer games are available, such as:
* MMORPG Massively multiplayer online role-playing game
* MMORTS Massively multiplayer online real-time strategy
* MMOFPS Massively multiplayer online first-person shooter
* MMOSG Massively multiplayer online social game

Examples include: *World of Warcraft*, *Final Fantasy XI* and *Lineage II, Guild Wars, RuneScape*

Virtual worlds are computer-based simulated environment intended for its users to inhabit and interact via avatars. These avatars are usually depicted as textual, two-dimensional, or three-dimensional graphical representations, although other forms are possible (auditory and touch sensations for example). Some, but not all, virtual worlds allow for multiple users. The computer accesses a computer-simulated world and presents perceptual stimuli to the user, who in turn can manipulate elements of the modeled world and thus experiences telepresence to a certain degree.Such modeled worlds may appear similar to the real world or instead depict fantasy worlds. The model world may simulate rules based on the real world or some hybrid fantasy world. Example rules are gravity, topography, locomotion, real-time actions, and communication. Communication between users has ranged from text, graphical icons, visual gesture, sound, and rarely, forms using touch, voice command, and balance senses. *Examples include:* Active Worlds; Kaneva*;* Second Life*;* Smallworlds, Metaverse. Virtual world can also be used with virtual learning environments, as in the case of what is done in the Sloodle project, which aims to merge of Second Life with Moodle**.**

Mind and concept mapping applications
1. **FreeMind**: FreeMind is a popular mind mapping software written in Java that allows you to technically outline essays, personal goals, and more.
2. **Pimki**: This personal information manager will help you be more productive.
3. **Cmap Tools**: Create concept maps with this free program, as long as it's for personal use only.
4. **MAPMYself**: This web-based mind mapping tool is all about the organic mind mapping experience with ideas that literally branch out.
5. **Mindomo**: Mindomo is another online mind mapping software program that features a simple, streamlined interface.
6. **WikkaWiki**: This PHP software program is described as "lightweight" and designed for speed.
7. **RecallPlus LITE**: The LITE version of this study notes software is free and can keep you organized.
8. **DeepaMehta**: This open source knowledge management tool is designed according to cognitive psychology principles, helping you learn more effectively through mind mapping.
9. **Semantik**: Semantik is a mind mapping tool designed for students who need help with essays and other papers.
10. **Labyrinth**: This open mind mapping tool is written in Python and designed to be simple and easy to use without sacrificing advanced features like copy/pasting from a clipboard, saving as an image, and more.
11. **View Your Mind**: VYM is a thinking and planning tool that helps students and other users with time management, creativity, organization, and other skills.
12. **MindRaider**: MindRaider is a personal notebook and organizer that lets you use clips from the web, your files, and your brain to stay organized.
13. **VUE**: Visual Understanding Environment is an open source project created by Tufts University for students and teachers. The mind-mapping program depends on highly visual, digital images and tools to help you stay organized and to boost creativity.

Visualisation / graphical
A tutorial: http://www.visual-literacy.org/pages/documents.htm

http://manyeyes.alphaworks.ibm.com/manyeyes/
http://www.cs.kuleuven.ac.be/~hmdb/infovis/delicious/del.icou.us%20visualization.html
http://openviz.com/