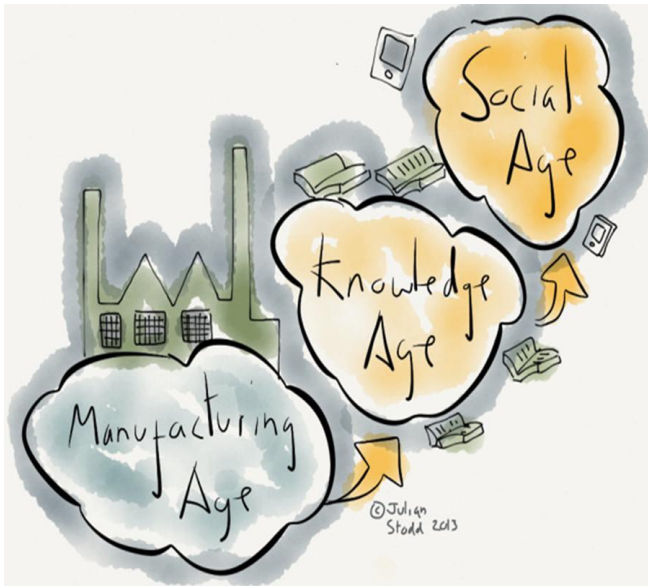# TOWARDS EDUCATION 3.0 : Narrative for the Evolution of Education, Creativity & Learning Ecologies in HE

Norman Jackson with a lot of help from Jackie Gerstein[1]

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Birth of an adaptive idea

Twitter drew my attention to an interesting article by Jackie Gerstein (1) in which she used the well known evolutionary metaphor Web 1.0 to Web 2.0 to Web 3.0 to illustrate a similar trend in education from Education 1.0 towards Education 3.0. This trend in educational thinking and practice began in the Industrial Age, progressed through the Knowledge Age and is now entering what Julian Stodd (2) calls the Social Age. I felt inspired by Jackie's interpretation and brilliantly illustrated idea to see if I could 'piggy back' on her article and extend the evolutionary metaphor to creativity and the idea of learning ecologies? (3,4).

Education 1.0 / Creativity 1.0 / Learning Ecology 1.0

Education 1.0 is essentialist, behaviourist and instructivist education based on the three Rs – receiving by listening to the teacher; responding by taking notes, studying text, and doing worksheets; and regurgitating by taking the same assessments as all other students in the cohort. Learners are seen as receptacles of that knowledge and as receptacles, they have no unique characteristics. All are viewed as the same. It is a standardized/one-size-fits-all education (1)

Our educational system is founded on the assumption that teaching is necessary for learning to occur (5) and critical to students' creative development is the teachers' pedagogic stance which Erica McWilliam (6) categorises into one of three types - 'sage on the stage' (knowledge transmitter / instructivist theory), 'guide on the side' (facilitator / constructivist theory), and 'meddler-in-the-middle' (an involved co-learner/co-producer in the learning process / constructivist and connectivist theories).

In the 1.0 version of education the teacher acts as 'sage on the stage' and education is operationalised as a process for transferring information from the teacher to the student who receives and tries to make sense of it. Traditional venues for teaching - such as the classroom are organised to support this mechanistic process and learning is treated as a series of steps to be mastered, as if students were being taught how to operate a machine or even, in some cases, as if the students themselves were machines being programmed to accomplish tasks (5). The ultimate end point of a mechanistic approach is efficiency. The goal is to learn as much as you can, as fast as

you can. In this teaching-based approach, standardisation is a reasonable way to do this, and testing is a reasonable way to measure the result. The processes that necessarily occur to reach the goal, are considered of little consequence in themselves. They are valued only for the results they provide.

In the instructivist approach, knowledge exists independently of the learner, and is transferred to the student by the teacher. The teacher-centered model requires the student to passively accept information and knowledge as presented by the instructor. This pedagogical approach is the dominant teaching-learning model in universities around the world. The internet and related technologies have been used to support the model for example in enabling the learner to (1):

Access information via ebooks and websites, but these often lack any type of interactivity or capabilities for the learner to comment, share, or interact with the content.

Watch, learn, and take notes from live and/or video lectures that focus on didactic dissemination of content and information.

Use technologies and mobile apps based on drill and grill where learners are given direction instruction via these technologies and asked to provide the correct answers via quiz questions. (I classify these technologies as worksheets on steroids

Education 1.0: Teacher is a Sage on the Stage, learners are receptacles for transmitted knowledge. There is ample scope for teacher creativity but little room for students' creative development

Creativity 1.0 In this environment the teacher has scope to be creative in the way she finds, makes sense of and uses information in her teaching strategy and the resources she creates. As a professional learner she is the main beneficiary of the affordances for creativity in the process. She might also utilise her creativity to create learning activities that engage learners and engage in questioning that tests and advances their understanding. But from the learners' perspective there is little room for individuality or personal creativity in this approach and the teacher determines what

is creative. In fact for the approach to work well the teacher requires compliance and conformance to exactly what the teacher wants the learners to do and learn and the assessment regime ensures that learners focus on the requirements rather than engage in more open-ended explorations in learning. Nevertheless, this approach does result in learning and changes in learners' understandings and this is the most fundamental level at which creativity takes place, 'any human act that gives rise to something new is.... a creative act regardless of whether what was created is a physical object or some mental or emotional construct that lives within the person who created it and is known only to him *Lev Vygotsky 1930 (7)*

Learning Ecology 1.0 We can use the idea of learning ecology to frame the evolution of learning processes within formal education environments. A learning ecology is (3,4) 'the process(es) we create in a particular context for a particular purpose that provides us with opportunities, relationships and resources for learning, development and achievement'. This definition represents the integration and interdependence of the elements of learning and achievement which include the contexts and spaces we inhabit, including our history, relationships and resources, (the most important being knowledge and tools to aid thinking), and our will and capability to create a learning process for a particular purpose. Such actions may be directed explicitly to learning or mastering something but more likely they will be primarily concerned with performing a task, resolving an issue, solving a problem, or making the most of a new opportunity. Learning ecologies have temporal dimensions as well as spatial and contextual dimensions: they have the capability to connect different spaces and contexts existing simultaneously across a person's life-course, as well as different spaces and contexts existing in different time periods throughout their life-course.

Extending the metaphor, learning ecology 1.0 is the traditional classroom-based learning ecology where teachers working within the instructivist model of teaching with a pre-determined curriculum or syllabus containing specific knowledge and opportunities for skill development and supported by an appropriate set of resources, engage their students in a process for the explicit purpose of learning which is predetermined by the intended learning outcomes. Learning and achievement reflect mastering the content of the course, determined through teacher assessments. In this type of learning ecology the learner has little or no involvement in the design of the ecology they simply participate in one that has been designed for them.

This approach to education is not intrinsically wrong. It is the way that most of the world has been educated to date. It is only wrong if this is the only approach that is used to encourage and support learning in formalised learning environments. What follows is an exploration of two additional perspectives on formal education.

Education 2.0 / Creativity 2.0 / Learning Ecology 2.0

'Education 2.0 takes on the characteristics of an andragogical, more constructivist teaching orientation where the principles of active, experiential, authentic, relevant, and socially-networked learning experiences are built into the class or course structure.' (1)

Many teachers become dissatisfied with the instructivist approach and start to think of better ways of engaging students more actively in learning through processes. They know that they learn best when they themselves are motivated to formulate and solve their own problems, when they ask questions and their curiosity drives them to search for and gather information from different sources, and when they devote time to making sense of it and change their own understandings in the process. This realisation or perspective change might cause a teacher to imagine and then bring into existence new strategies for teaching inside and outside the classroom that encourage learners to adopt this more constructivist approach to learning. At this point teachers may blend or even replace the sage on the stage pedagogic stance with that of guide on the side, or even meddler in the middle (5) becoming more of a facilitator or disrupter to encourage learners to find things out for themselves and learn with and from each other.

Education 2.0, like Web 2.0, permits interactivity between the content and users, and between users themselves. With Web 2.0, users move from just accessing information and content to being able to directly interact with the content through commenting, remixing, and sharing it via learning activities inside and outside the classroom and using technologies like social media platforms that support the sharing and reshaping of content. Technologies that permit users to communicate directly with one another synchronously and asynchronously and that enable people to communicate and create content in many different ways - text, audio, video, music, pictures, animations to name just a few.

Like Web 2.0, Education 2.0 includes more interaction between the teacher and student; student to student; and student to content and others. Education 2.0 has progressive, humanistic roots where the human element is important to learning. The teacher-to-student and student-to-student relationships are considered integral to the learning process. Education 2.0 focuses on – communicating, contributing, collaborating and co-creating and is formed around principles of constructivism (rather than the instructivist principles of Education 1.0). The learning

process acknowledges that learning is not only a cognitive process but also a highly social and often physical and emotional process.

Learning Ecologies 2.0 The ecologies created by the teacher are ecologies for collaborative learning. They are therefore co-created with learners as learners are empowered to help shape them.

Pedagogies and learning contexts and strategies like problem-, project-, enquiry- research- and field-based learning actively encourage learners to define and explore problems, build and utilise relationships for learning, and discover resources and possible solutions for themselves sometimes in contexts that are unfamiliar. In some learning contexts learners make new physical objects and/or make new things happen. Such pedagogies and practices help learners develop the will, capability and confidence to extend into and create their own learning ecologies within the world outside formal education.

Learning ecologies 2.0 recognise that there is a world of learning and achievement outside higher education and that one of the objectives of a higher education is to prepare learners for this world of ambiguity, uncertainty and emergence where there are rarely single right answers to problems only many possibilities and learning is about deciding which possibility to run with and make work. The relevance of education to real world situations becomes very important in Education 2.0 and Learning Ecologies 2.0 often aim to simulate or even incorporate real world experience.

Education 2.0 & Learning Ecologies 2.0 are enriched when the technologies of Web 2.0 are utilised: technologies like social media platforms, wikis, personal websites and blogs which encourage and permit collaboration, social learning and co-creation of knowledge and artefacts, the sharing of personalised learning, personal reflection and curation of knowledge so that it can be shared. There is a shift to openness and willingness to share in the Web 2.0 world unlike the closed world of Web 1.0 which makes it a more supportive environment for creativity to flourish.

With greater freedom presented for learning comes a need for self-regulation - the need for personal learning and action to be underpinned by conscious planning, action aligned to plans, self-awareness and habits of reflection to learn through and from experience. In constructivist environments metacognition becomes an important target for development and learners are required to develop the skills to record, reflect on, draw deeper meaning and learning from their experiences. The recognition that learning that is personal to the individual means that there has to be a perspective change in what counts as learning and new approaches to assessment have to be developed to recognise such learning. In the UK this perspective change has been encouraged through the systematisation of personal development planning (PDP) and the use of e-portfolios and a wealth of Web 2.0 technologies to support this process (8).

*Creativity 2.0: A*ffordances for students' creative development are significantly enhanced in Education 2.0. But to achieve this goal teachers have to believe that their students' creativity is worthy of development and care enough to create opportunities for development. Teaching for students' creative development requires a pedagogic stance that is facilitative, enabling, responsive, open to possibilities, collaborative and *mutually co-creative* and which values process *as well as* outcomes.

Students will be creative if they are given permission and the right conditions and challenges. Education 2.0 has the potential to provide this but for learners to develop their understandings of creativity attention must also be paid to enabling them to become conscious of their creativity as they are using it. Borrowing from practice in the architects' studio, the champion of reflective

teachers Professor John Cowan, describes a collaborative teaching and learning scenario in which the development of understanding of creativity, the criteria through which it might be evaluated, and the process of claim and judgement making, is grown by all participants (including the teacher) through the learning processes (9). Working backwards, the results of creative thinking and action are embodied in a self-peer and teacher assessed portfolio – with significant emphasis on self-assessment. Here teachers and students can benefit from the wealth of Web 2.0 technologies and tools that enable them to record their imaginative ideas and their actions to turn ideas into practical realities. It is only by paying close attention to how personal creativity features in an individual's process that he/she can truly learn what creativity means in the particular circumstances of his/her life. This perspective on personal creativity aligns well with Carl Rogers constructivist explanation of personal creativity: 'the emergence in action of a novel relational *product* growing out of the uniqueness of the individual on the one hand, and the materials, events, people, or circumstances of his life'(10).

Example of the conversion of a traditional lecture based course in design and production fashion garments into an active learning close to real world experience
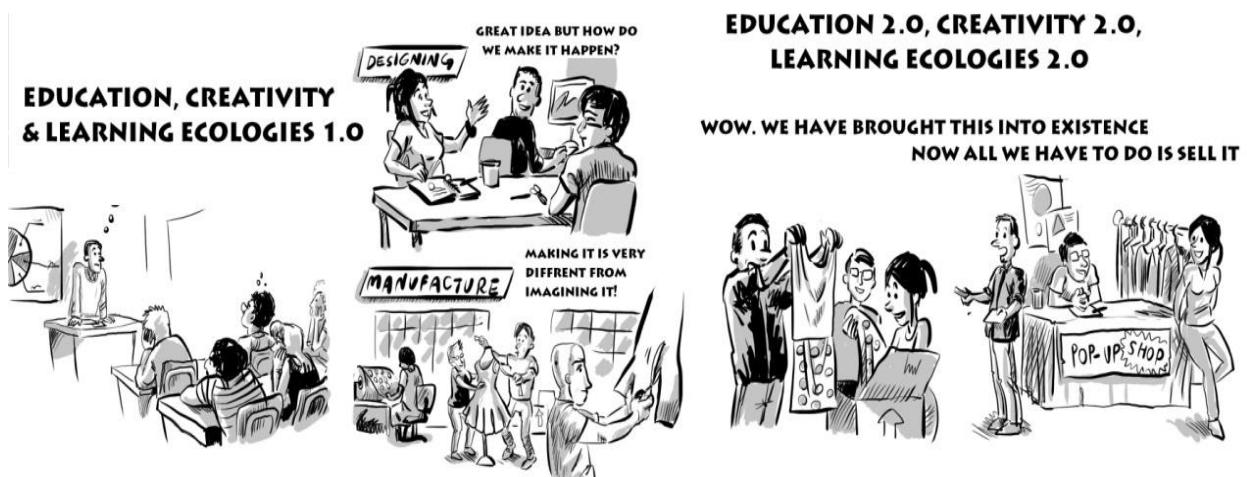
Emergence of Education 3.0 / Creativity 3.0 / Learning Ecology 3.0

We are entering a new age of communicating and learning which some commentators have termed the Social Age (2). Enhanced connectivity is at the heart of changing our behaviours and habits in how we find, use, develop and distribute information and knowledge and create new meaning and understanding. The Social Age might be defined in terms of 'the creation of *value* (knowledge, understanding or learning and relationships) by connecting individuals who want to share their interests, knowledge, passions who form a relationship to co-create new understandings(11). The Social Age began with Web 2.0 technologies but we are now morphing into Web 3.0 as a result of ever faster and increasingly pervasive

broadband, wifi, 3G + 4G technology that enable connectivity almost anywhere at any time with infinite information resources and personal knowledge residing within personal learning networks.

Education 3.0 is a more heutagogical, connectivist approach to teaching and learning. The teachers, learners, networks, connections, media, resources, tools create a unique entity that has the potential to meet individual learners', educators', and even societal needs. Education 3.0 recognizes that each educator's and student's journey is unique, personalized, and self-determined (1)

Gerstein (1) provides a useful summary of the Education 3.0, heutagogical, connectivist learning environment. Learners:

- Determine what they want to learn and develop their own learning objectives for their learning, based on a broad range of desired course outcomes.
- Use their learning preferences and technologies to decide how they will learn.
- Form their own learning communities possibly using social networking tools suggested and/or set up by the educator. Possible networks, many with corresponding apps, include: Facebook, Twitter, Edmodo, Instagram, Blogging sites, Youtube, and other social networks.
- Utilize the expertise of educators and other members of their learning communities to introduce content-related resources and suggest Web 2.0 and other online tools for that the students could use to demonstrate and produce learning artifacts.
- Demonstrate their learning through methods and means that work best for them. It could include using their mobile devices to blog, create photo essays, do screencasts, make videos or podcasts, draw, sing, dance, etc.
- Take the initiative to seek feedback from educators and their peers. It is their choice to utilize that feedback or not.

The idea of connectivity and connectivism underlies the concept of Education 3.0. George Siemens (12) defined the characteristics of connectivism in these terms:

- Learning and knowledge rests in diversity of opinions.
- Learning is a process of connecting specialized nodes or information sources.
- Learning may reside in non-human appliances.
- Capacity to know more is more critical than what is currently known.
- Nurturing and maintaining connections is needed to facilitate continual learning.Ability to see connections between fields, ideas, and concepts is a core skill.
- Currency (accurate, up-to-date knowledge) is the intent of all connectivist learning activities.
- Decision-making is itself a learning process. Choosing what to learn and the meaning of incoming information is seen through the lens of a shifting reality.

Education 3.0 builds on and subsumes Education 2.0. It embraces more directly and comprehensively the idea that learning is personal, social and informal, as well as more formal notions of academic learning. Education 3.0 is characterized by educational designs and opportunities provided by institutions where the learners themselves play a key role as creators of knowledge artefacts that are shared, and where social networking and social benefits play a strong role in learning. The distinction between artefacts, people and process becomes blurred, as do distinctions of space and time and the boundaries between professional learners (teachers) and student learners are blurred.

Education 3.0 subsumes the four Cs of Education 2.0 communicating, contributing, collaborating and co-creating and also includes the additional C's of connecting, collectives and curating (the products of collective learning). It subsumes the constructivist principles of Education 2.0 and adds in the emerging principles of connectivism. Learners are pro-active in authoring their own learning lives and in helping their peers author theirs.
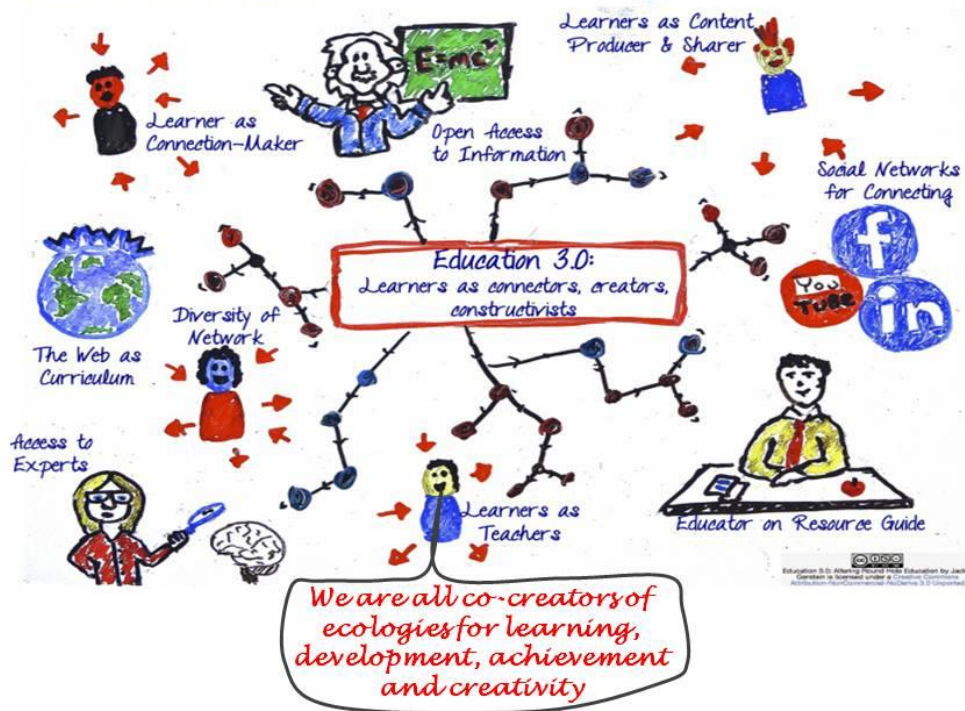
Education 3.0 encourages us to see the world from the learner's perspective where formal educational opportunities are but one element of a much richer lifewide set of learning experiences and opportunities that are co-created by the learner and any number of organisations, communities and contexts. This lifewide perspective on education (13) opens up possibilities within formal education for the recognition of *self-determined and self-directed but supported student learning ecologies* (Learning Ecologies 3.0). Examples of such ecologies are found in Negotiated Work-Based Learning (NWBL) or Lifewide Education where the learner's contexts are essentially unstructured learning environments - like the work place, community settings, playing sport, travel scenarios, families and other social /cultural situations. In such situations the role of the teacher is that of a coach, mentor and validator, providing guidance and critique to help learners visualise, plan, record and ultimately gain recognition for learning and development that they claim and demonstrate. These forms of support and recognition vary in the extent to which they focus learners' attention on specific goals and outcomes or they encourage learners to define their own goals and achievements. Support may also be given to encourage and facilitate interaction between learners engaged in a similar process.

Douglas Thomas and John Seeley Brown (5) view this emergent phenomenon from a cultural perspective.

'In the new culture of learning, people learn through their interaction and participation with one another in fluid relationships that are the result of shared interests and opportunity. In this environment participants all stand on equal ground – no-one is assigned the traditional role of teacher or student. Instead, anyone who has particular knowledge of, or experience with a given subject may take the role of mentor [or leader] at any time.'

'We call this environment a COLLECTIVE – a collection of people, skills and talent that produces a result greater than the sum of the parts. Collectives are not solely defined by shared intention, action, or purposes. Rather they are [also] defined by an ACTIVE ENGAGEMENT with the process of learning. Communities derive their strength from creating a sense of belonging. Collectives derive their strength from active participation'. At its logical best then Education 3.0 encourages and supports the conditions for a culture of collective inquiry. 'In the new culture of learning, collectives, as we define them, become the medium in which participation takes shape. They are content-neutral platforms, waiting to be filled with interactions among participants. As such they are well defined to facilitate peer to peer learning, their raison d'etre'.

'Finally, in the teaching-based approach [Education 1.0], students must prove that they have received the information transferred to them - that they quite literally 'get it'. In the new culture of learning [Education 3.0] the point is to embrace what we don't know, come up with better questions about it, and continue asking those questions in order to learn more, both incrementally and exponentially. The goal is for each of us to take the world in and make it part of ourselves. In doing so, it turns out, we can re-create it.'

Learning Ecologies 3.0: The idealised view of Education 3.0 is that learners create their own ecologies for learning and development and participate in the learning ecologies of other learners. Together these ecologies coalesce to form 'collectives'. Teachers are but one member of a collective and depending on the inquiry or problem being tackled they may or may not be an expert contributor. But what they might be expected to be good at is meddling, nudging, provoking, challenging, encouraging and hopefully inspiring as well as modelling responsible participation and revealing their own learning.

In this conceptual space learners create their own ecologies for their self-determined learning projects in study, work or other contexts outside formal education. Their learning is not driven by the need or desire for formal recognition, rather it is driven by deep intrinsic interests, curiosity and need. They determine goals, contexts, content, process, resources and relationships. Learners may choose to incorporate Open Educational Resources and Open Educational Practices (like recording and reflective processes), offered by formal education providers, into their learning process but they are the architects of their own learning designs.

Creativity 3.0 The idealised view of Education 3.0 contains the most affordance for individual and collective creativity since it is embraces the real world with all its uncertainty, ambiguity, authenticity, challenge and opportunity. Learning and achievement are driven by intrinsic motivations, passions and needs of learners, rather than the intended outcomes and assessment practices determined by teachers.

The invention, adaptation and evolution of a learning ecology is the fundamental creative process on which individual and collective learning is founded. It's a process of imagining and making, and out of it emerges the opportunity for creating new meaning. Such evolving social situations provide endless affordance for creative ideas and creative actions to turn ideas into something meaningful. This is the fundamental nature of creativity 3.0 and it is embodied in Carl Rogers' conception of personal creativity, 'the emergence in action of a novel relational *product* growing out of the uniqueness of the individual on the one hand, and the materials, events, people, or circumstances of his life'(9).

Closing Remarks

The world gets ever more complex and complexity has been pushed to another level very quickly through the internet and the information and communications technologies that have grown with

it. The evolutionary pathway outlined by Jackie Gerstein through Education 1.0 to 3.0 provides a useful conceptual tool to imagine the changes that are taking place with each new developmental phase subsuming the one before so that all these educational approaches now co-exist. It is not a case of one scenario replacing another: we need all of them in an education system that prepares people for the complexities of their future lives. The challenge and the wisdom is in combining and integrating these approaches into the higher education experiences of learners in a relevant and meaningful way.

I have witnessed and participated in this amazing shift over the last 20 years which has liberated formalised learning and associated creativity in a fantastic and inspiring way and will continue to do so in decades to come. We are only at the start of a whole new era of technologically enabled and enhanced personalised and social learning. I feel privileged to have grown through and with this development. I know that sooner or later I will get left behind as my capability, energy and enthusiasm for participating in ever more sophisticated technologically enabled practices for learning wanes. But I accept that is the way it will be and I am grateful for the chance to participate in it now. The one thing I do know is that I will carry on learning until the day I die or am no longer able to do so.

1 Acknowledgements

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Norman Jackson 05/12/14 @lifewider1 @academiccreator http://www.creativeacademic.uk/

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