

## Editorial - Special Issue: Emergent Learning, Connections, Design for Learning



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In a digital world dominated by social media, networks, and instant communication, the creation of viable, effective, and sustainable learning environments remains a challenge for designers, administrators, teachers, and learners.

The purpose of this special issue was to examine this challenge through a lens of connections, emergence, chaos, complexity, fractals, and quantum theory, which are terms that originated and have been widely studied in the natural sciences, and which are now appearing as important interdisciplinary ways to understand both natural and social sciences, including education. The question therefore arises, are the traditions of what it means to teach and learn being challenged by these concepts, or are we simply experiencing the natural evolution of education through a process of emergence, connections, and the design experience?

As editors of this issue, we proposed the following frameworks to provide a prompt for the submitted papers.

- **Emergence** encourages random encounters, paying attention to your neighbours, and “more” being different. Through such encounters and interactions we can look for patterns in the signs which can be extrapolated to an entire system, the intelligence of which comes from the bottom up, and where low-level rules can create high levels of sophistication.
- The **connections** being made between people through social networks has emphasised “connectivism,” an emergent theory of learning where the interactions that are generated by these connections, whether informal or formal, have the potential to result in new, emergent knowledge.
- For **designers**, taking account of emergence and connections can challenge the tradi-

tional models which have been used to create ‘instructional order.’ Emergence theory offers insights into complex adaptive systems that can self-organize, a quite different way of conceptualising the teaching/learning space.

Given this interaction between connections and emergence, and the significant impact this interaction will have on how we teach and learn, it is important therefore to analyse what it means to design for emergent, connected learning experiences.

The more we (as practising online teachers and researchers) reflect on the encounters students experience when enrolled in online courses, the more we see the need for different ways of conceptualising the online learning space. From our experience at universities in both Australia and the United States, we are seeing online courses that ask students to do little more than read, regurgitate, and respond, the very antithesis of the collaborative, open, and flexible environment proposed for the online learning experience.

In response to that, we have argued (Irlbeck, Kays, Jones, & Sims, 2008) that reconceptualising the online learning space as one that is proactive and enabling students to test the boundaries of knowledge is the preferred aim of online learning rather than keeping students inside those boundaries. When we look at the work of Jonassen (2010), who argues for the integration of problem-solving into the educational experience, we can begin to see further connections, that problem-solving can be the trigger for the possibility of emergent knowledge. We can see also solutions that are not premeditated and that potentially might change to a broader understanding of the context in which that problem was initially established.

Knowledge is dynamic and boundless, and the online learning environment provides the perfect set of tools and connections to redefine current understandings and perceptions. To reflect on these concepts we have selected six research articles and two reflective pieces that shed light on new ways of thinking about teaching and learning, especially those that address the more informal and emergent ways of educational thinking.

The first paper to note is presented by David Murphy in the Research Notes section; his reflections of a PhD journey are insightful and provide a background for the thinking that has informed the focus for this special issue. The ideas and issues raised by David lead us to question whether we should continue to subscribe to the traditions of “instructional design” or whether we need to adopt more *chaotic*, organic, and ecological models for design, perhaps tapping more into the essence of human learning rather than the mechanics of design. The second reflective paper by Carlo Ricci provides a valuable set of examples of emergent learning both in terms of informal learning external to the formal school setting and the integration of mobile “apps” into unstructured learning experiences. Using three examples of young children using different “apps”, Ricci argues they provide a means to emergent learning which Williams, Karousou, and Mackness (2011, p. 41) have described as “learning which arises out of the interaction between a number of people and resources, in which the learners organise and determine both the process and to some extent the learning destinations, both of which are unpredictable.”

Through these reflections we have a context for the current research which is presented to shed light on different ways we might think about teaching, about learning, and about the environments in which educational interactions occur.

The first research paper by Gail Casey considers the application of social networking in the high school environment and the potential for enhancing education through connected learning. The extent to which the class group becomes the empowering force, rather than the teacher, is one of the most interesting findings from Gail's study, questioning the traditional role of teaching and curriculum. Most telling is Gail's conclusion that we need to look beyond the constraining nature of formal education and consider a more holistic, organic, and ecological perspective:

When writing his book *Fractal Horizon* Pickover (1996) described watching the surf break and considered the billions of water particles responding separately to the conflicts between gravity, wind, inertia and cohesion. One could make links to this surf breaking if one could imagine each student as a water droplet. Each droplet is measuring its own local forces from moment to moment and calculating its own path through the chaos. The result is a thing of beauty.

Beginning to appreciate the complexity of human systems and interactions is a start to realizing the potential our student groups can bring to the creation of emergent knowledge.

Pekka Ihanainen and John Moravec provide a different perspective of teaching and learning, examining the notion of facets of time within contemporary pedagogy, "creating a diverse ecology of time constructs within learning systems." Examining the interplay and overlap between microblogging (a *pointillist* activity) and discussion forums (a *cyclical* activity), the authors present contentious conclusions such as,

when pointillist learning is examined from a pedagogical point of view, it opens itself as an anti- or a de-pedagogy. This means that pointillist learning cannot be taught - it just happens! And, because it happens so frequently, it is one of the most natural forms of learning for humans.

Arguing that "the chaordic nature of learning (overlapping cyclical, pointillist, and tempo-normative learning) in en-pedagogical systems cannot be managed," the authors ask how "we can best leverage these multidimensional opportunities of pedagogical time to facilitate multidimensional learning and meaningful new knowledge production." The narrative reminds us that the empowerment of learners and learning enabled through social networks and time-dependent communications is challenging the accepted and traditional notions of teaching and learning.

The third paper, presented by Marta Kawka, Kevin Larkin, and Patrick Danaher, addresses a critical question with respect to the affordances of social networks and the resultant informal and emergent learning: “whether institutional frameworks can accommodate the opposing notion of ‘cooperative systems’ – systems that facilitate the creation of user-generated content?” Embracing the broader themes articulated for this issue, the authors compare practices of interactive art, where “the focus is on the articulation of meaning through the work; meanings are not static and predefined but co-created in the process of interaction” and reinforce the potential for co-creation of knowledge, emergent knowledge, within the educational context. Using a two-dimensional matrix (interaction and knowledge-source) the authors examine a design continuum that enables student-regulated interactions and the emergence of unpredictable outcomes. While we contend there is debate as to whether emergent systems can be designed, we do acknowledge that we remain in an education society that is traditional. Even so, the conclusions that “those involved in the design and delivery of learning must become increasingly sensitive to learning which emerges from their students rather than imposing learning outcomes upon them” encapsulates again the threshold of change we are witnessing in the educational sector.

Focusing on a more theoretical perspective, Katherine Janzen, Beth Perry, and Margaret Edwards propose that

If it is accepted that there are multiple ways of knowing (Netzer & Mangano, 2010) then it follows that there are multiple ways of learning. If there are multiple ways of learning, then multiple ways of explaining how individuals learn must be requisite.

Arguing for the implementation of a *quantum perspective of learning*, the authors remind us that “human beings share connections with themselves, other individuals, the environment and the universe (Hare, 2006). Quantum holism suggests that this interconnectedness extends infinitely in all things, in all places, and at all times.” It is this mindset, a common thread in the papers presented, that highlights a shift from learning being restrained by educational models to learning as an holistic, almost spiritual, outcome. By introducing a quantum layer over the current discourse of teaching and learning, the authors demonstrate how new ways of thinking about our field are critical and that we need to think of the design of the associated environment quite differently; for example, “Online learning needs to be multidimensionally constructed and occur in various planes/dimensions in order to access holistic development.” As the authors demonstrate, enabling teaching and learning practice to develop and improve is not just about research within current understandings, but being bold enough to examine pedagogy through quite different lenses.

Rita Kop, Hélène Fournier, and John Mak provide a very concise summary of our current place in teaching and learning research: “The structure of the learning environment, the place and presence of learners and educators within institutional boundaries, the nature of knowing and learning are all challenged by the fast pace of technological change.” They

raise the key question, implied through each of the papers presented in this special issue, of whether it is appropriate to put the responsibility for the learning process onto the learners themselves. In doing so, the role of formal educational institutions is also called into question: Are they able to meet the challenge from and compete with the ever-growing and ever-connected web of knowledge? Presenting a comprehensive study of two massive open online courses or MOOCs (one with 1,641 participants and the second with 700+ participants) the authors highlight both the benefits that accrue from intentional education networks (such as visualisations of connections and resources) and deficiencies (such as limited facilitator involvement and management). The authors conclude that “meaningful learning occurs if social and teaching presence forms the basis of design, facilitation, and direction of cognitive processes for the realization of personally meaningful and educationally worthwhile learning outcomes,” reiterating the need for independent and motivated participants (who each play both teaching and learning roles) and that while such large networks have strong learning potential, the reality of its achievement depends on both the motivation and experience of the participants and the acceptance of a knowledge network as a legitimate learning space.

The final paper provides a second perspective on the massive open online course (MOOC) and the importance of addressing the complexity of our environment not through preparation for the future, but participation in the creation of possible futures (Davis & Sumara, 2008). Through their analysis, Inge de Waard and her co-authors demonstrate ways in which the MOOC can be self-organising, connected, and open and emphasise the linking of mobile and social elements: “This is the first time in history that learning content can be accessed via mobile devices and social media. This expands knowledge acquisition beyond the traditional classrooms and libraries, hence redefining those spaces and adding to knowledge spaces overall.” The authors provide evidence as to the dynamics of the MOOC, the importance of sharing, and that “dialogue has always been at the center of knowledge exchange.” As with the other papers in this issue, the consensus is unequivocal: We are now in an age where we can interact and engage anywhere and anytime, and participants in learning are more readily able to know what knowledge they need, and where to find it, to achieve learning outcomes.

Through these insights we contend that the days of traditional teaching or instructing are limited, that we are on the cusp of different ways of learning such that new knowledge will emerge as a result of both formal/structured and informal/unstructured interactions, and that this knowledge will integrate seamlessly into relevant global networks. Within this context it is simply no longer sustainable to think of designing courses for instructors to deliver; rather, we must design, as best we can, for learning that will be a product of interactions between participants, learning that will come from within and without the formal classroom and learning that will focus on proactive change rather than reactive recollection.

## References

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