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Towards a literacy of attention

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In 1997, business trend analyst Linda Stone proposed the term "continuous partial attention" to characterise the contemporary experience of wanting to be 'a live node on the network'. She argued that while it can be a positive and functional behaviour, it also has the potential to be disabling, compromising reflective and creative thought. Subsequent studies have explored the ways in which technology has slowly disrupted the idea and experience of a "centred" and "bounded" self. Studies of 'Gen Y' show the ease with which young people accommodate this multiplying of the self as they negotiate their partial friendships and networks of interest with family and work. In teaching and learning circles in tertiary education we talk a lot about problems of student 'disengagement'. In characterising our challenge this way, are we undermining our potential to understand the tendencies of contemporary learners? This paper begins a consideration of how traditional models, frameworks and practices might oppose these partially engaged but continuously connected and interpersonal "dividuals". What questions does this provoke for learning environments towards harnessing yet counterpointing the crisis students might experience; to recognise but also integrate their multiple selves towards what they aim to become through the process of learning?

Keywords: attention management, engagement, multi-tasking

Introduction

In 1997, former Microsoft analyst Linda Stone proposed the term "continuous partial attention" to characterise the contemporary experience of always wanting to be "a live node on the network" - not wanting to miss anything (Stone, 2005). It is an "attention strategy", akin to multi-tasking but born of a different impulse. Where multi-tasking often has the goal of making more time for ourselves by efficiently packaging activities with low cognitive demand that can be (safely) undertaken together, continuous partial attention is a "high alert" state, within which we are always scanning our network contexts for opportunities. And significantly, Stone offers, it is experienced as a form of crisis.

Stone also describes continuous partial attention as a "post-multitasking adaptive behaviour" (Stone, 2008). And importantly, where multi-tasking is supposedly motivated by productivity, continuous partial attention is motivated by a desire to maintain continuous connection to others and to the information that flows from those others. It is amplified through the technologies that now pervasively augment the existence of many people, like mobile text messaging, email, and social network sites like Facebook. For example, current research is revealing a dependency amongst youth on mobile phones that is largely tied to the anxiety of not falling out of touch with others. Our desire to be in a continual loop of sociality can be, in these terms, an anxiously addictive one (see Walsh, White & Webb, 2007).

Stone spotlights continuous partial attention in order to problematise it for broader understanding. While it can be a positive and functional behaviour she argues that it also has the potential to be disabling, particularly by building anxiety and compromising reflective and

creative thought. At its first utterance in 1997 the concept of continuous partial attention struck a chord but it has yet to be fully unpacked in terms of implications, particularly for learning and cognition. What is most clear is that whether it is symptom or strategy, it characterises the experience of many people, young and old, as they socialise and interact in the conduct of daily life. And while continuous partial attention and multi-tasking might have been identified as differently motivated behaviours when Stone first considered the problem of continuous partial attention, it could be argued that in the technologically-mediated and supported contexts of work and learning, they are closely associated. Information anxiety and information overload are also close relatives.

Since Stone catalysed awareness of the behaviour, other contemporary attention-related concepts and phenomena have been popularly identified, including “ambient interruption” (Armano, 2008), the “attention crash” (Rubel, 2007), and “blinking” (Sherman, 1996). The networks are awash with discussion about these attention-based behaviours relating to, or arising out of, internet and communication technologies as knowledge workers in various guises, instantiate and diagnose their experiences with continuous partial attention, multi-tasking and “hyperattention” (Hayles, 2007). For over a decade, dissemination and discussion of these issues has been sustained in blogs, newspapers, journals, radio and television. Despite the offering of a multitude of salves in the form of remedial self-help websites, books, personal productivity software tools, as well as significant studies in the area of cognition, the issues persist and are now complicated by a larger concern about generation-based differences in capability of dealing with them.

The unsustainability of continuous partial attention

Often invoked in discussions about the experience of attention-dividing behaviours is a wondering about the negative effects that arise out of a deficit of focus. In Stone's consideration, anxiety is certainly a factor. She notes that many people are trapped in the “shadow side” of continuous partial attention: feeling over stimulated, out of control and experiencing a decline in productivity.

Over time, research studies have quantified losses, in dollar terms, to productivity as a result of attention-related behaviours. These studies take into account the time on a task before an interruption occurs, the time taken up by the distraction, and subsequently the time taken to recover focus and return to the original task. One study estimated that work interruptions represented a loss of 650 billion dollars a year to the US economy (Teach, 2007). But bundled up in the financial loss is the supposition of cognitive loss, which for many is the greater cause for concern, particularly in learning contexts. In a course developed at Emory University in the USA, David Bray and his information technology students, problematise overload demand on human attention through a frame of cognitive sustainability. They appropriate Orr's definition of sustainable design as “the careful nesting of human purposes with the large patterns and flows of the natural world.” In particular Bray is concerned with the larger sense of how knowledge economies, which are also attention economies (see Davenport and Beck, 2001; Simon, 1971; Goldhaber, 1997) may trouble this sense of “careful nesting” by generating unprecedentedly large quantities and densities of information through networks. Questions arise as to what is cognitively sustainable in human terms, and how technologies may either erode or maintain this position? (Bray, 2007)

Technology-abetted community and sociality

Communication ... defines social reality and thus influences the organization of work, ... the curriculum of the education system, formal and informal relations, and the use of "free time" - actually the basic social arrangements of living.
Herbert Schiller, *Communication and Cultural Domination*

Questions about cognitive sustainability are important, especially as people now find themselves in a particular situation *vis a vis* technology: the technologies through which they are spending their precious attention are often also those through which valued social ties are constructed. This is why continuous partial attention is considered by Stone to be so problematic. Arguably contemporary sociality in the industrialised world is largely a technologically-enabled sociality. Internet and communications technology have altered the structure of social communication in observable ways away from “densely knit and bounded neighbourhood groups” to “loosely bounded and sparsely knit” networked societies (Wellman, 2001, p. 2031). According to Wellman, computer networks are inherently social and irresistibly so it seems. In networked societies the boundaries by which groups of people may have been contained, pre-internet, are now much more permeable. “Interactions are with diverse others, linkages switch between multiple networks, and hierarchies are flatter and more recursive” (p. 2031). Also, these computer-supported social networks or networked communities are partial in that people tend to loop through interactions with multiple others or sets of others. As they do so, their relations are complicated as they branch out through space. But as they ramify and proliferate, so too they multiply the number of possible communications, or portlets to information in which an individual might receive and engage. Each of these represents a tug at an individual’s attention of a greater or lesser magnitude. The limits of time and attention are always a constraint to sociality (see Feld, 1981), so the ramification of associations that computer supported networks enables is of great consequence, because as Linda Stone underlines, we don’t want to let go of any of it. Because this connectivity is afforded through the technological portals at which work undertaken (literally the computer screen) whether fixed or mobile, time and attention become scarce.

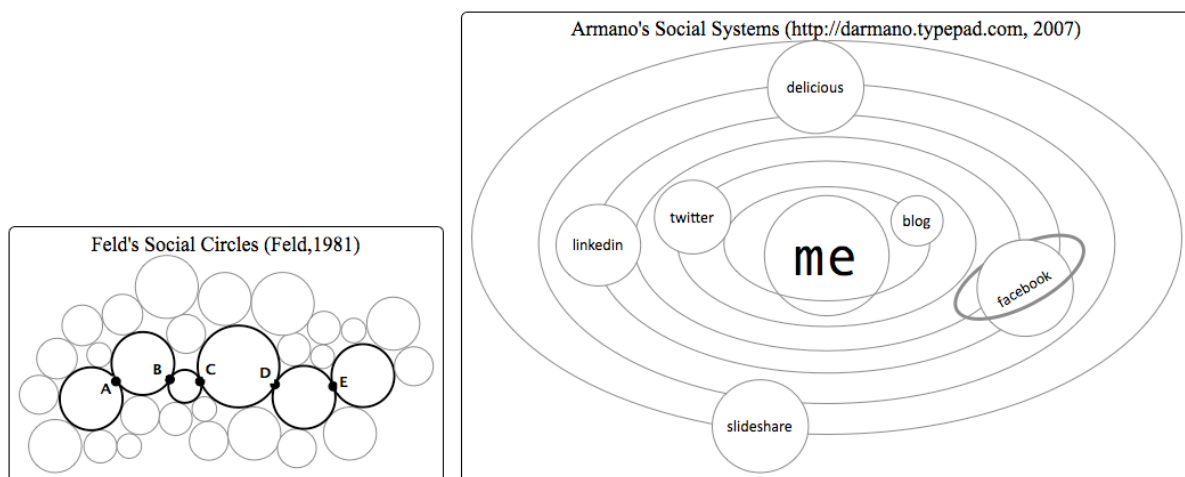


Figure 1: Social systems, old and new (by author, redrawn from Feld and Armano).

An interesting comparison of two diagrammatic conceptions of the structuring of social systems is illustrated in Figure 1. Curiously both apply a planetary metaphor yet the systems they describe are quite different and in their difference, map a shift in the experience of sociality. In the diagram adapted from Feld, the circles represent groups of people associated

through a particular focus (like being in the same family, or sporting team, or having the same hobby). Key people (A, B, C, D, E) are imagined as moving in planetary motion, alternating between participation in multiple orbits. They exist as the loose connectors linking larger social circles and scribing a social pathway from person A to person E, for example. Feld's diagram captures a world where an in-person sociality is the principal medium for clustering around a social focus. The number of social circles an individual participated in is valued and managed through the limits of time and attention. In David Armano's "Social Systems" diagram of computer-supported sociality, an individual is likened to a sun, metaphorically at the (ego)centre of a personal "micro-universe". But literally, also, an individual is simultaneously a participant/inhabitant in each of the planets held together by the weaker ties that make up many of the connections in a social software network.

Many of us are now managing multiple social ecosystems. If you think of these as planets—some rotate in closer proximity to us. We "warm" them with our attention frequently. Others may orbit at further proximities—but they are still in our social systems. When we abandon a social ecosystem that we can no longer sustain, it drifts away from our orbit and dies. Many of us have had these experiences. But when we find ourselves as the supplier of light in our self-created microverse, the implications become clear. There are only so many ecosystems that we can meaningfully sustain. (Armano, 2007, p. Social Systems)

Again, through Armano's analysis, the sustainability dilemma arises. His conception also absorbs questions of the self and the limitations of its energy for sustaining attention and connection across these potentially vast and ever expanding egocentric microverses. So then, it is interesting to consider the effects that a computer-networked, partial, yet ramified, sociality might have on identity and self. Gergen (1991) explores the ways in which technology (from railways to air travel to television and beyond) has slowly disrupted the idea and experience of a centred and bounded self to give way to a "multiphrenia of partial and conflicted senses of self" through which identity may take varying forms from one social context to another. "In electronic conversations, the individual thinker moves into the multiplicity and diversity of the social world, and in social interaction tries out many roles and positions." (Cooper, p. 143) While consequential to many of us, this seems to be a particular issue arising out of studies of Generation Y (aged in their late teens to mid- to late twenties) and particularly Generation M (the so-called "Millennials" aged eight to late teens) which spotlight the apparent ease with which young people accommodate a multiplying of the self as they negotiate and orchestrate their partial friendships and networks of interest with family, school and work. Judith Donath (2007) speculates on the changing nature of relationships and identity that are already emerging as a result of social network sites (SNS) in younger generations, and considers what might lie ahead should SNS-based "supernets" actually ramify to such an extent that significantly large populations use them extensively.

At present, according to Donath, the greatest potential of SNS-based networks is to escalate personal information flow:

As Granovetter (1973, 1983) demonstrated, a key strength of weak ties is their ability to provide a wide range of information. Despite the ubiquity of mass media, personal networks remain an important information source. People can use their beliefs about another person's knowledge and credibility to assess new ideas that come from that source. People care about many matters that are too personal, too local, to be part of a central repository. They may care more that people they

know recommend a book than about how it is generally received. By increasing the number of weak ties one can maintain, social supernets have the potential to expand their users' range of information sources, while maintaining a socially local context of personal acquaintanceship. (Donath, 2007, n.p.)

So, beyond the binding of sociality and information, the association of socially constructed judgment with information and knowledge presumably has significant implications for educational contexts.

Disengaged and distracted or agile and connected? Conceptualising new literacies of attention

For some years now the problem of student “disengagement” in tertiary education has been under consideration. Most famously in the Australian context, Craig McInnes’ Inaugural Professorial Lecture at the University of Melbourne’s Centre for the Study of Higher Education (2001) instantiated certain patterns of behaviour as evidence of disengagement, such as students’ decreased motivation to study, declining attendance at campus for lectures and tutorials except when absolutely necessary, and requests to schedule studies around paid employment. McInnes’ study captures aspects of economic and social dimensions of the phenomena. He considers the role of ICT in education, but doesn’t interrogate the effects of technology in shaping who students are and what they like to do with it even as they walk through the university gates for the first time. This is likely a result of the timing and focus of McInnes’ research.

The research and interests of others usefully augment the discussion with considerations of the larger cultural effects of technology and media on the preferences and behaviours of students and other learners (Langridge, 2003, Hembrooke and Gay, 2003). Recent large-scale and high profile projects like the study of media in the lives of “Generation M” (the Kaiser Family Foundation) and the proposition of new literacies to account for the proliferation and pervasiveness of new media technologies (the Macarthur Foundation’s Digital Media and Learning Initiative). Arguably also, it is not only witnessing students texting and Facebooking in lectures and tutorials that press the issues, but the honest realisation that those who undertake knowledge work in the industrialised world are all, to a lesser or greater degree, having to balance a multitude of demands on our time and attention. It’s not just a so-called generational issue. Most academics understand the power of peer-supported validation, the value of collaboration and networking for social and intellectual gain, the proliferating conduits through which new knowledge and understanding are forged and disseminated. According to the studies of Roberts and Jenkins, this is what young people are experiencing implicitly in their engagement with and through new and social media.

In 2006, the Macarthur Foundation (a US-based private and independent grantmaking organisation) launched a large, five year initiative to determine how digital technologies are affecting and transforming all aspects of life for young people. A key project - “Confronting the Challenges of Participatory Culture: Media Education for the 21st Century” - led by Henry Jenkins of MIT, examines and analyses young people’s involvement in participatory internet culture, which takes the following form:

- Affiliations— memberships, formal and informal, in online communities centered 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)
(Jenkins et al., 2006, p.3)

New social skills and cultural competencies are required in order to fully participate in the opportunities of new media culture, argue Jenkins and his coauthors. They emphasise the socialness of these skills, which are seen as ways of “interacting within a larger community” and not “individualised” for “personal expression” (p. 21). Proposed is provisional set of eleven core skills of Play, Performance, Simulation, Appropriation, Negotiation, Distributed Cognition, Collective Intelligence, Judgement, Transmedia Navigation, Networking and Multi-tasking (see Figure 2).

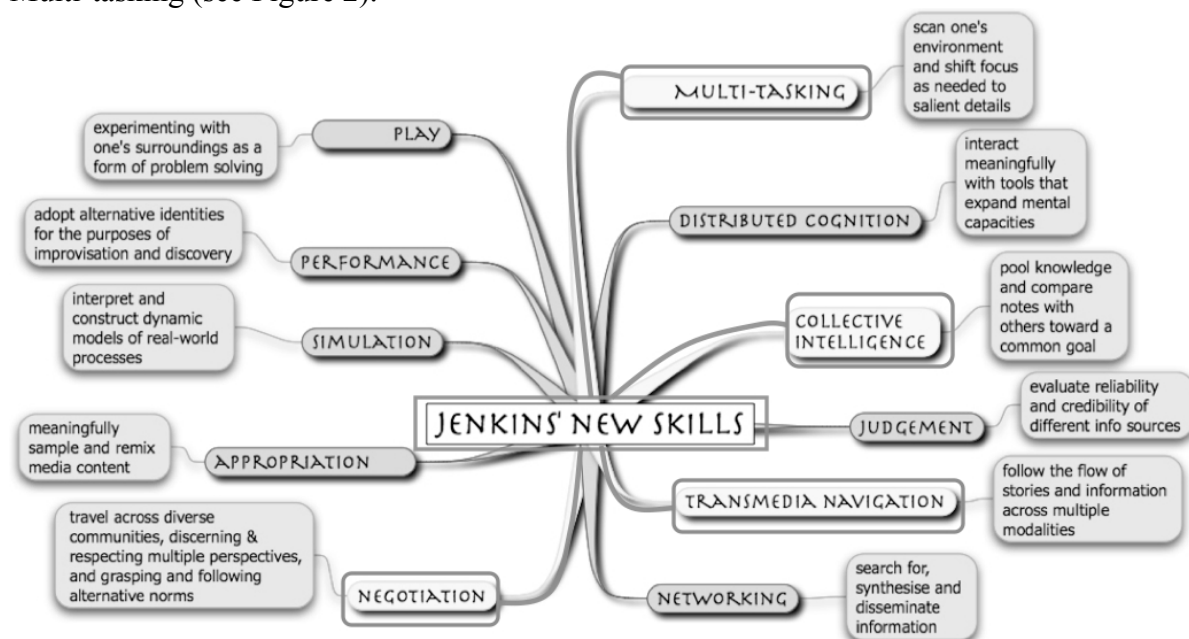


Figure 2: New learning skills (mind-mapped by author based on Jenkins et al).

The set is provisional in so far as Jenkins and team have a broad sense of which competencies are likely to matter as young people move from their world of constructive, connective “play and education” into the adult world of “work and society”. Several of the skills intersect with the attention-based issues under consideration in this paper. The most obvious is the inclusion of multi-tasking as a new media literacy. Jenkins and his colleagues consider that attention is an important cognitive ability. But while its effective management is critical and learning to sharpen focus is important, in a rich media context, it is very important also to be good at attending broadly to information and signals:

Multi-tasking and attention should not be seen as oppositional forces. Rather we should think of them as two complementary skills, both strategically employed to intelligently manage constraints on short-term memory. Whereas attention seeks to prevent information overload by controlling what information enters short-term memory, successful multi-taskers seek to reduce demands on short-term memory mapping where different information is externally stored within their immediate environment. (Jenkins et al., 2006, p.35).

Offered are the analogies of the farmer and the hunter to characterise two cultures of attention: “The farmer must complete a sequence of tasks that require localised attention; the hunter must scan the landscape in search of signs and cues of where their prey might be hiding” (p.35). Citing Hartmann, Jenkins et al. argue that schools for centuries have been set up for the education of “farmers”. Looking to the future, the school system will need to value both. In particular, students will need support for building skills and understanding about when they are off-task, how to get back on track, and how to handle multiple tasks at the same time.

Multi-tasking enters pedagogical practice when teachers recognise the desires of contemporary students to come at topics from multiple directions all at the same time or to maintain what some have called “continuous partial attention”, interacting with homework materials while engaged in other activities. (p. 36)

Similarly, and to place this a little closer to the context of higher education, Katherine Hayles explores the issue from the perspective of cognitive modes or styles: the difference between deep attention and hyper attention. Deep attention is that which is focused and sustained, preferring a single information stream. Hyper attention is characterised through rapid task switching, feeding on multiple information streams, with a low tolerance for boredom. She suggests that in evolutionary terms, hyper attention came first (the hunter again) and that deep attention is a relatively luxurious state, requiring some sort of civilised protection to attain. The educational system has specialised in environments and activities conducive to, and demanding of, deep attention. In our contemporary context, as young people enact their preferences for hyper attention, tensions are arising:

...serious incompatibilities arise between the expectations of educators, trained in deep attention and saturated with the assumptions about its inherent superiority, and the preferred cognitive mode of young people who squirm in the procrustean beds outfitted for them by their elders. (Hayles, 2007, p. 188).

Hayles argues for careful reflection on how a constructive synthesis between deep and hyper attention could be attained and cites experiments in higher education settings that are taking steps along this road, such as backchanneling in which participants in the ordinarily focussed setting of a lecture are invited to post to a chat space building a running commentary on presented ideas, and google-jockeying where participants search for appropriate web content to augment, oppose, or define the speakers’ content which then gets publicised for consideration on one of many screens on view in the learning space.

Conclusion

Examples of activities such as those cited by Hayles show how the current engagement with information and communication technologies in higher education is becoming evermore implicit in what Snyder, Marginson and Lewis characterise as 'e-constructivist' pedagogy based on socially co-constructed and situated knowledge and understanding. This approach encapsulates the belief that ICTs will enhance the experience and capabilities of ‘the proactive, reflective, self-regulated learner’ (2007, p.189). This association seems sensible and even somewhat straightforward, but arguably, the idea and cognitive implications of attention management make it less so. The all-important reflective state is perhaps a state that is becoming harder to reach thanks to the distractions of the socialised media network.

In this characterisation are intertwined the two domains of the technological and the conceptual. Siemens and Tittenberger (2009) define the key elements of educational change as technological and conceptual. Today, technological transformation is magnetised by innovation in e-learning, mobile devices/mobile learning, learning networks (now converging to create a space of almost ubiquitous - continually accessible u-learning). Conceptual change encapsulates the aforementioned contemporary preference for certain student-centred models of education, and in particular the advancement of theories that emphasise learning as socially constructed, conversational, and collaborative. Bringing the technological and the conceptual together engages a revolutionary dimension, according to Siemens and Tittenberger.

Large scale transitions, such as were evident in the democratic revolutions across Europe in the late 18th century (conceptual) and industrial revolution in the late 18th and early 19th century (technological), transform the large institutions of society: government, education and religion. (p.1)

Against the earlier revolutions based primarily on either conceptual or technological terms, it is the energy created by the duality of the technological and the conceptual in the current situation that is transformative, and potentially generative of productive outcomes in higher education. Their intertwining is certainly generative of speculation into the epistemological infrastructure of learning in such a dynamic context. In 'People of the Screen', Christine Rosen (2008) queries our changing relationship to text-based media and the act of reading and states that 'every technology is both an expression of a culture and potential transformer of it.' (p. 21)

Opening up understanding of how so-called attention dividing social software technologies are transforming our culture of learning is the base goal of this paper. Experiments like backchannelling, Google jockeying and their ilk, are useful for demonstrating and testing tactical ideas for dealing with attention styles and social media in the context of learning. They are also valuable in so far as they build a bridge between the formal setting of the classroom and what Jenkins' refers to as affinity spaces. Affinity spaces are the spaces of informal learning cultures that social network sites and new media technologies and environments describe. But do these activities help the farmer understand the hunter, across the generations and vice versa? Intuitively, they should, if each can recognise the shadow traits of one, in the other.

The idea of an affinity space is arguably an appropriate one to apply in rounding out the issues under review here, if only to acknowledge that we are in the midst of dealing with large issues for which answers and directions are not clear. From our own experience, and from the shared research and chatter in the networks that seek to explore these issues, understanding and managing attention is clearly at the heart of the matter. What is exciting and stimulating is to participate in this discussion, to build the collective intelligence (as per Jenkins' new literacies) around what the distractions of participatory internet culture, social network sites, mobile media and other communications technologies mean for conceptions of attention in relation to learning.

It would seem that the conflation of the social with the informational through networks is what makes for compulsive viewing, so to speak. It is what gets our attention and subsequently generates all of the other great values and affordances of the technologies.

While appearing to be opposites, the constructive synthesis of attention states into learning environments, and the didactic articulation of the value of attention to students, are the strategies that could be applied in working through the implications for attention-related behaviours. A consideration is needed as to how deep and hyper attentive states are reconciled through reconsidered educational methods, how formal and informal learning cultures are integrated, and how attention is a literacy in its own right (beyond multi-tasking) so learners develop deep awareness of its integrity in effective learning and working.

Without this, deep thinking is thwarted in the networked world. Information literacy is a map we can draw and invite others to follow, but attention literacy will be the muscle that learners have to build to ensure they move purposefully into the 21st century.

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