Mobile Learning Technologies and the Move towards 'User-Led Education'

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Abstract

Recent advances in media technologies are deeply intertwined with an overall shift towards more user-led content production models in a large variety of fields – some observers describe this as the move towards a 'Generation C' of active and intercreative users, or towards a hybrid user/producer or 'produser', replacing traditional production/consumption models. The increasing adoption of such user-led, community-based, collaborative models for the co-creation of 'content' requires current and future graduates to display skills and capabilities which are significantly different from what has been expected of students in the past, and therefore needs teaching approaches which not only describe these literacies, but *live* them – modes of teaching which are themselves user- (or student-) led, collaborative, and flexible, and address the needs of Generation C. This paper provides a strong argument for this shift in pedagogical paradigms. It examines current needs in industry and society to argue for this shift, provides some pointers to possible solutions, and considers the role mobile and wireless technologies can play in this project.

Keywords:

Mobile, wireless, m-learning, e-learning, Web 2.0, Generation C, produser, literacies, graduate capabilities, knowledge economy

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Mobile Learning Technologies and the Move towards 'User-Led Education'

Even outside of major changes to funding and governance dictated by the governments of the day, higher education institutions in Australia and elsewhere in the world find themselves currently at a period of great changes. This is due in part to changes in content offerings and global education market structures, which are beyond the scope of this paper, but just as importantly it is driven also by significant changes in learner and teacher cohorts, and in the technology available for learning, teaching, and everyday communication and information. With an emphasis on realising the potential offered by the increasing availability of mainstream mobile and wireless technologies, this paper will outline these changes and chart their potential implications.

The New User

International public relations watchdog *Trendwatching.com* (2005) recently identified a new 'Generation C' (for 'content', in the first place) as successor to 'digital' or 'net-related' generational descriptions (e.g. Prensky 2001a, b; Oblinger & Oblinger 2005). Where previous generational groupings had been decried as 'Generation Me' – interested mainly in their own advance and pleasure in life, with scant regard for the common good or an equitable distribution of resources and knowledge –, Generation C is distinctly different: it is the generation responsible for open source software development, music filesharing, *YouTube*, *Flickr*, and the *Wikipedia* (Kaplan-Leiserson, 2005).

Indeed, in consequence, this generation exhibits a strong preference for the knowledge commons over a proprietary hoarding of information, and (though not inherently anti-commercial) supports those corporations who work with consumers and are seen to be strong contributors to the common good rather than profiteering from it. (Notably, some such corporations and other organisations, from open source companies to the Wikimedia Foundation, have recently emerged from Generation C's favourite environments.)

Any description of a new 'generation' of participants in global knowledge creation is necessarily overgeneralised and flawed, of course; certainly, Generation C should not be considered as composed of participants of uniform age and socioeconomic background: rather, its constituents are a loose but significant grouping of people who share common aims. Yet even correcting for such *caveats* and the inevitable boosterism found in the likes of *Trendwatching.com*, it is nonetheless evident that there does exist a broad stream of information and knowledge users who no longer follow the existing rule books – and *Time Magazine*'s recent recognition of this coalition of active content creators and collaborators as 'Person of the Year 2006' (under the collective pronoun 'you', no less, suggesting an almost universal spread of this phenomenon throughout its readership) adds further support for a description of this movement as a significant new social force which has considerable and fundamental implications for the creation and provision of learning environments (Grossman 2006).

Generation C, then, exists across a wide variety of social, economic, and intellectual domains. While perhaps emerged from a few key hotspots (such as open source, *Wikipedia*, the blogosphere, and *Flickr*), the

fundamental techno-organisational principles of such environments are now being appropriated and mainstreamed across wide swathes of the World Wide Web under the moniker of 'Web 2.0', and have found application in the context of virtually any form of human intellectual and creative endeavour accessible through the Web. Concomitantly, the permissive intellectual property frameworks which form an inalienable basis of collaborative, Web 2.0, Generation C work have spread alongside the technological frameworks – open source or creative commons licences no longer find their application mainly in software development or creative work, but now govern information and knowledge as diverse as government records, satellite photographs, and legal contract forms.

Mobile and wireless devices allow for a further extension of the Web 2.0 phenomenon, enabling it to reach beyond the confines of the wired network and connect directly to users and devices in changing and remote locations. It is no surprise, therefore, that a number of theorists and developers are now working to establish the terms 'Mobile 2.0' or 'Mobile Web 2.0' to highlight such advances (e.g. De Waele 2006; Jaokar 2006a, b; Appelquist 2006) and even staged a high-profile 'Mobile 2.0' conference in November 2006. The ubiquity of Web 2.0 tools which is the ultimate result of such advances affords users further and extended opportunities to enact their status as members in Generation C.

Fundamental to much of Generation C's activity, and an outcome of C's growth as well as a precondition for its success, is a reconfiguration of traditional production/consumption models. Even recent models of knowledge production in late capitalism maintained a general disconnect between

producers and consumers – consumers were enabled to act as 'citizen-consumers' (Hartley 2004; CCi 2006) or expert 'prosumers' (Toffler 1971), whose preferences and feedback would inform the development of new consumption goods, but were largely unable to participate directly in the production process. The relative impotence of letters to the editor in traditional newspapers, or even of discussion fora on newspaper Websites, when compared to the direct involvement of readers as reporters in fully-fledged citizen journalism projects, underlines this point, as does a comparison of *Britannica* and *Wikipedia* (cf. Giles 2006). In the latter cases, users are no longer readers, audiences, or mere consumers – they have the ability to become active producers of content, and are often able to do so on an *ad hoc*, on-the-fly basis. They occupy a hybrid, user-*and*-producer position which can be described usefully as that of a *produser* (see Bruns 2006).

Whatever specific environment these produsers operate in, then, their produsage can be seen to exhibit four fundamental aspects:

- it results from a shift from dedicated individuals and teams as producers to a broader-based, distributed generation of content by a wide community of participants;

- it allows for the fluid movement of produsers between roles as leaders, participants, and users of content; such produsers may have backgrounds ranging from amateur to professional;

- its artefacts are no longer products in a traditional sense: they are always unfinished, and continually under development; such development is evolutionary, iterative, and palimpsestic;

- and produsage is premised on permissive regimes of engagement which are based on merit more than ownership; they frequently employ copyright systems such as Creative Commons and GNU which acknowledge authorship and prohibit unauthorised commercial use, yet enable continuing collaboration on further content improvement.

Produsage, in other words, is the core user-led activity of Generation C. Originating in good part from open source and similar environments, it also has historical connections to the pre-commercialisation model of scientific research, and other ideals of open intellectual engagement.

Towards User-Led Education, via Mobile Technology

Assuming, then (on the basis of good and growing evidence), that Generation C and its produsage-based forms of intellectual engagement constitute a significant paradigm shift in the late capitalism period, it is incumbent for higher education to engage with and address this shift. This must take place on two distinct but related levels: on the one hand, it is important that graduates leave university equipped for successful participation in produsage environments – requiring at least a significantly altered set of literacies and capacities. On the other hand, and in order to develop such capacities in an organic fashion, it is necessary that universities themselves explore ways to authentically model the processes of produsage in their learning and teaching environments (and beyond). Traditional and rigid teacher/learner, staff/student, university/client dichotomies are counter-productive in the co-

creative, collaborative process of produsage, which – as noted above – thrives on a fluid, heterarchical organisation of participants.

Mobile and wireless devices can play an important role in counteracting the production- rather than produsage-based paradigms that still exist in much of mainstream higher education. In and of themselves, mobile devices already present a challenge to the traditional paradigm (and conversely can be seen as being allied to the produsage cause): they, too, enable hybrid uses and ad-hoc connections and collaborations between individual participants, and through their role as (essentially) always-on, always-available, flexible personal communication devices undermine the traditional political economy of more rigidly structured, fixed-line communication technologies. (This is well borne out in research covering mobile phone uses as diverse as the interactions of Japanese teenagers, African villagers, and European executives – see e.g. Ito *et al*. 2005; Abissath 2005; Centrica 2005.) As convergence between mobile phones, wireless laptops, and other hand-held devices continues apace, the technological capabilities and potential uses of such devices are only set to grow rapidly, of course (also see Jenkins 2006).

There is space in this paper only to touch on some of the specific uses which may be made of mobile and wireless devices in the service of a mode towards more user-led higher education, but this is no disadvantage: beyond individual case studies, which are environment- and technology-specific and likely to date quickly as new advances in technology, pedagogy, and knowledge arise, it is far more important at present to work towards developing an overall pedagogy of produsage using mobile and wireless technology. At the same time, it is useful briefly to outline some of the benefits

of using wireless technology in higher education settings, noting also directly some of the common production-paradigm pedagogies which such uses may be able to address and alter:

- **Broadcast-style lectures:** often by economic necessity, many lectures in higher education institutions continue to follow a model which has lecturers broadcast information and knowledge to be absorbed by learners (and discussed in tutorial classes). It is self-evident that this model is inherently incompatible with a user-led style of education, and indeed, the dwindling attendance at such lectures which many academics experience throughout the semester is a sign of a fundamental disconnect between learner expectations and teacher methodologies. However, in defence of teachers, it is more complex (and usually too expensive) to replace lectures with other and more collaborative, discursive modes of knowledge engagement while still ensuring uniform quality of teaching.

  In a now highly technologically enabled university environment, mobile and wireless tools can offer significant help here: they could possibly open up a non-disruptive backchannel for communication from learner to teacher and between learners, which can be incorporated effectively into lectures (and in turn thus moves these from 'lecture' to 'conversation'). Using such means, students are able to provide feedback to the lecturer as they discuss the material – asking (and answering) questions, adding information, even diverting the course of the discussion into other, unforeseen fields. In essence, then, learners

and teachers in this model begin to collaborate – they co-create, or *produse*, the lecture script together as the lecture takes place.

Technologically, this form of collaborative lecture-conversation is already very achievable (see e.g. Perry 2003; Belt 2001) – students could use SMS messages to a university server, or wirelessly delivered postings to an online message board or instant messaging service to participate in the conversation. Teachers could further assist this process by turning their lectures into more open-ended conversations, possibly shifting more 'hard information' into pre-lecture readings or podcasts, freeing up time for discussion.

- **Knowledge imbalance between teacher and learner:** while university teachers' special position amongst their class remains justified to some extent, in many circumstances, it is now a commonplace observation that in a variety of domains students can be seen to be as knowledgeable, informed, or skilled (at least in regard to specific aspects of the topic) as their teachers. In such contexts, the teachers' role is often to facilitate the development of a more systematic overview of the topic and its situatedness in relation to ancillary fields. In practice it often remains difficult for staff and students to overcome the teacher/learner dichotomy and create the space for a more learner-centred and user-led learning experience. Indeed, the physical teaching *space* itself can be an issue in this context, as it often privileges teacher over learners by way of simple spatial configuration.

Mobile and wireless technologies are only one means to overcoming such problems, but can play an important role nonetheless.

Web 2.0 tools themselves (such as wikis and blogs – see e.g. Bruns and Humphreys 2005; Farmer 2006) can play an important initiating role, as they are already configured to allow input and collaborative content co-creation from a large number of participants without necessarily imposing any one fixed hierarchical structure on the process. It is worth noting that while such structures *are* possible, and must be chosen with care by teaching staff to provide the appropriate balance of creative freedom and effective guidance.

The mobility of wireless technologies enables an escape from the spatial tyranny of the classroom, which – even if largely symbolic – nonetheless should be seen as an important step. Wirelessly mobile students are able to form groups and collaborate on their tasks on a flexible and *ad hoc* basis which models very closely their future working lives in a knowledge economy; this realisation may be heightened even more if tasks involve the gathering of information and knowledge (especially also in the forms of audiovisual materials) from off-campus. It may even be reasonable to postulate that the less time spent on campus in the pursuit of such tasks, the more authentic a task may appear to students.

- **Disconnect between on- and off-campus life:** anecdotal evidence from learners suggests that the perceived disconnect between the theory encountered during study and their own everyday lived

experience is one of the main factors affecting student satisfaction. The strong focus on authentic learning which has been a major feature of pedagogical developments in higher education in recent years emerged partially in response to such problems, and aims to draw direct connections between study material and assessment tasks on the one hand, and students' current and future (work) life on the other. Work integrated learning in a variety of forms and formats is a particularly important aspect of this process.

Again, mobile and wireless tools can be of significant assistance in achieving authentic learning goals, as they enable learners to take their learning away from campus and into the world, and their experiences from outside university with them to study. As mobile and wireless devices available in the student population become simultaneously more widespread and more capable, pedagogical approaches in higher education are better able to make effective and systematic use of such technologies. Ultimately, it is likely to alter the on/off-campus balance, but it is unlikely that this will make the university campus experience redundant altogether, as students continue to express a strong interest in being amongst their peers and teachers at least for some of the time. In the process, this will also affect campus infrastructure (with more fixed computer labs giving way to laptop docking stations), and raise equity issues to be addressed by universities (enabling students from lower socioeconomic backgrounds to purchase or borrow laptops and other devices required).

Towards User-Led Education: The C4C

Arguments to shift to constructivist and authentic models of learning are not new (see for example, Piaget 1972; Bruner 1974; Vygotsky 1978 and Boud 1993). Instructional models have also been refined to leverage ICT within authentic learning environments (e.g. Oliver and Herrington 2001; Herrington and Herrington 2006). However, for the first time learners have the capabilities as well as access to the tools (Jonassen *et al.* 1999; Boud & Prosser 2002; Brook & Oliver 2003). Moreover, as proposed by Prensky (2001a) and Kaplan-Leiserson (2005) and consistent with Generation C capabilities, students can be active participants in the design and development of courses as co-creators of content, particularly through access and contribution to the increasing number of sharable and reusable learning objects and communication and content generation tools, such as wikis and blogs.

Within this context, mobile and wireless technologies are tools and a means to encouraging progress towards user-led education, not an end in themselves. As such, then, their use must be embedded in a wider pedagogy of user-led education. It is beyond the scope of this paper to sketch out this pedagogy in any detail – but it is possible here to outline the four pillars upon which they could be founded, consistent with the fundamental characteristics of the new processes of produsage that are common to Generation C.

As indicated in the previous discussion, effective and successful participation in produsage processes for Generation C graduates requires the development of a set of capacities differently conceived from those currently

taught in most institutions. These graduate capacities can be summarised as collaborative, creative, critical, and communicative capacities – or in short, as *C4C*.

- **Creative:** not to be misunderstood as pertaining purely to artistic creation in a narrow sense, creative capacities are crucial to Generation C as produsage itself is fundamentally concerned with content (information, knowledge) creation. And while the development of creative capacities in this broad sense has been a long-term aim of education, to focus on the development of creative capacities which can be exercised successfully in the collaborative environments of produsage is particularly important for the emerging context (as exemplified *inter alia* in the technological environments gathered under the Web 2.0 banner). Crucial to *this* form of creative capacities, then, is particularly the ability to act as collaborative co-creator in flexible roles, or in short, as one amongst a number of creative *produsers* rather than as a self-sufficient creative *producer*.

- **Collaborative:** as noted above, collaborative engagement under variable, heterarchical organisational structures and in shifting roles is fundamental to produsage processes. As societal as well as workplace processes move towards a greater embrace of produsage principles, collaborative capacities therefore become all the more crucial. In this context, it is as important to be able to collaborative effectively as it is to know when, where, and with whom to choose to collaborate, and under what circumstances not to do so. Further, collaborative

capacities also require an advanced understanding of the implications for and consequences of collaboration – that is, of questions pertaining to intellectual property and other legal and moral rights in a collaborative environment.

- **Critical:** as a corollary to collaborative capacities, critical capacities are exercised in establishing the appropriate context for engagement in produsage processes. This requires a critical stance both towards potential collaborators and their work (in order to identify the most beneficial of all possible collaborations) and towards the practitioner's own creative and collaborative abilities and existing work portfolio (to gauge whether a potential collaboration would constitute a good fit of styles, abilities, and experience). Additionally, a critical eye is also needed in identifying the appropriate venue and conditions for effective collaboration – and further, during the collaborative process itself, critical capacities are indispensable in the giving and receiving of constructive feedback on the ongoing collaborative process and the artefacts it produces.

- **Communicative:** communication underpins every human endeavour and is therefore already implicitly embedded in the other capacities outlined here. However, in addition to overall communicative capacities, it is particularly important to develop an explicit focus on effective and successful communication between participants within the collaborative environments of produsage – this addresses for example the communication of ideas generated in the exercise of one's critical capacities (that is an ability to be *constructively* critical), as well as

communication between participants *about* collaborative and creative processes (what could be described in other words as metacollaboration). Such communicative capacities are not necessarily a natural outcome of general communicative development, but may need to be fostered specifically in order to enable graduates to act effectively and successfully as members of Generation C.

Towards Generation C

As noted at the outset, the idea of 'Generation C' is necessarily a blunt tool – an overgeneralisation which in spite of its limitations (like other 'generation' constructs previously) contains and condenses important observations associated with the paradigm transitions from production to produsage and the implications for learners and learning environments. Inevitably the extent and success of this paradigm shift is unclear at this time, though early indications point to fundamental changes in the information, knowledge, creative and cultural industries, which (as is by now well established – see e.g. Howkins 2001) themselves account for very significant portions of the economy in most developed nations. But the implications here are not simply economic in nature, as the concept of the knowledge industries inextricably weaves together economic development, human knowledge and social endeavour (Howkins 2001): Generation C and its produsers are just as crucial in opening up new environments for the development of ideas and social networks as they are in creating the potential for new economic activity.

Beyond 'content', then, the rise of Generation C also points to a number of other consequences, then, as *Trendwatching.com* notes: 'Creativity, Casual Collapse, Control, and Celebrity' (2005, n.pag.). Of these, creativity and control are perhaps the most obvious in our present context: we have already discussed at length the central role of creativity (understood broadly) to the produsage process, and conversely also noted the need to strike a balance between collaboration on produsage and the need to control one's own rights to intellectual property, and the importance of critically controlling the who, where, and when of collaboration.

By comparison, celebrity may be less relevant to the present discussion, other than to note that recognition (at least amongst peers, if not on a wider stage) for one's contributions to the produsage process can be a significant driver of produsage participation, and must be identified as such – indeed, peer (rather than merely teacher) recognition for constructive contributions to collaborative processes can be employed in education as an important motivating factor.

It is the idea of 'casual collapse', however, that must be of greatest concern for our current discussion. A casual collapse of the established hierarchies and institutions is the typical outcome of a paradigm shift – and produsage- and Generation C-driven casual collapses can already be observed in the music industry's struggle with MP3 filesharing, and in television producers' tentative steps towards exploring BitTorrent as an alternative means of content distribution. *Encyclopaedia Britannia*'s rearguard battle with *Wikipedia* and the news industry's struggle with citizen journalism serve as further examples in this context. What, however, of

educational systems themselves? These, too, are under increasing threat from a Generation C which on the one hand is able to access scholarly sources and debate at the touch of a button, from outside the system, and which is increasingly seen to jointly produse academic-grade information and knowledge resources of its own. As ivory towers crumble, traditional content-based, narrative-based or apprenticeship-style education is increasingly irrelevant or appropriate: higher education's competitive advantages now lie squarely in its ability to provide a strong combination of systematic overviews and deep engagement with specific fields of knowledge, and in its ability to provide a targetted course of study aimed at developing those C4C capacities which are crucial to successful participation in produsage environments. As we have seen, mobile and wireless technology potentially make an important contribution to these approaches, provided higher education education uses them effectively in order to avoid entering into a process of casual collapse itself.

Educators must reconceptualise learning designs that effectively leverage and build upon Generation C capabilities. Generation C characteristics have implications for designing effective and efficient learning environments and the skills sets required of current and future academic staff. Prensky (2001a, b) and Oblinger & Oblinger (2005) raised significant challenges for those responsible for facilitating learning for the emerging 'digital' generations. Fundamental to their propositions are the tremendous motivational advantage and efficiencies which could be gained by creating effective learning environments that exploit preferred digital communication and interactive styles. However, the challenges are significant. Even though

these learners have the capacity to learn from traditional teacher-centred approaches currently applied in higher education institution, these fail to leverage their preferred communication practices or digital skill sets. Most current e-learning environments depend on learning management systems that are little more than digital filing cabinets with communication add-ons. To date such systems have greatly improved convenient access to resources (Kvavik and Caruso 2005), but they have done little to shift communication patterns or change underlying pedagogy. As reported by Smith and Brown (2005, p. 2), the focus is on transmissive technological delivery aspects rather than constructivist pedagogical application of the online environment.

Although there are emerging 'Generation C' academic staff, many others do not fall into this category, and have a tendency to teach according to their own preferences rather than those of their students (Willems 2005). Given the competing pressures on young academics and the traditional environments they are immersed in, there is every possibility – based on historical trends – that they will teach how they were taught rather than create new and more powerful learning environments that more efficiently exploit learners' capacities and technologies. If so, this will impede developments which otherwise show significant evolutionary potential. While some tools, models and examples are available, these are formative and require further exploration, development and targeted resources and understanding from academic managers. The challenge for academic managers is to acknowledge that new ways may be unpredictable and beyond immediate comprehension, though blatantly obvious in hindsight. Academic managers' role is therefore to understand that new learning designs will take years to

mature and disseminate – during which time the technology of Web 2.0 and of

mobile and wireless devices and services will only make further advances, of

course.

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