

# RECONCEPTUALISING SCHOOLING FOR A WEB 2.0 GENERATION

Sandy Schuck and Peter Aubusson  
Centre for Research in Learning and Change  
University of Technology  
Australia

## Abstract

This paper frames and theorises the nature of adolescents' informal experiences in Web 2.0 environments to articulate their fit or misfit with current conceptions of school education. Adolescents are increasingly active Web 2.0 users. However, the traditional research and education communities have been slow to respond to the rapid emergence of the digital generational culture. Adolescents' new ways of interacting and producing are likely to render current configurations of schooling obsolete and hence demand new conceptualisations of schooling. This paper discusses how these new visions might influence, disrupt and interact with future schooling scenarios.

## Introduction

This paper considers the possible implications for schooling of adolescent activity in Web 2.0 read/write spaces. It presents arguments for considering such activity when thinking about future scenarios for schooling, and discusses whether adolescent Web 2.0 activity is pertinent to current and future ideas about schooling, learning and teaching. The aim of the paper is to stimulate debate and provoke thinking about learning and future schooling.

There is an urgent need to find out where new boundaries have emerged and to identify strategies for exploiting the fluid nature of adolescent Web 2.0 usage. Boundaries between private and public entities and between offline and online identities are blurring (Geftter, 2006) and implications of these shifts need investigation to inform school change. From a broader educational perspective, the use of social networking technologies provides an alternative to the dominant culture of schools (Heppell, 2000) and by implication a critique of current policy and practice.

## Adolescent Engagement with Web 2.0

Technology plays a significant role in the life of today's adolescents. Increasing numbers are comfortable using Web 2.0 technologies to connect with people and express themselves. The term "Web 2.0 describes the range of user-controlled publishing and networking websites that have emerged over the past 5 years, effectively giving people increased autonomy and a greater voice in their online

activities. This stands in contrast to older, less interactive Web 1.0 sites that limited users to passive viewing and information retrieval and whose content only the sites' owners could modify (O'Reilly, 2005). Web 2.0 embodies a "blurring of the boundaries between Web users and producers, consumption and participation, authority and amateurism, play and work, data and the network, reality and virtuality" (Zimmer, 2008, p. 1). Examples of these increasingly participative environments that contribute to a Web 2.0 ecology include (but are not restricted to) social networking, media sharing and manipulation sites, data/web mashups, conversational arenas, virtual worlds, social bookmarking, blogs, wikis and other collaborative editing sites (Crook, 2008).

In Australia, digital access is on the increase and patterns of usage mirror those of the UK, US and European countries. As of June 30, 2008, 52% of all Australian households had Broadband connections, an increase of 22% from the previous year. At the same date, 67% of Australian households had home Internet access and this figure rises to over 80% for households with children under 15 years of age (Australian Bureau of Statistics, 2008). A study of 751 Australian families containing 1003 young people aged 8–17 years by the Australian Communications and Media Authority (ACMA, 2007) found that young people spend about one and a quarter hours online each day on average. Over 40% of participants in the study had some of their own user-created material on the Internet and from age 14 this figure rose sharply to 70%. Among 16–17 year olds, two-thirds had an online profile in a social networking site, 1 in 6 had their own blog and 1 in 8 had published their own videos online. Similarly, a UK survey conducted in 2006 of 1,003 13–17 year olds and 1,003 parents found that 33% of the young people regularly use the Internet for blogging and 79% said they use Instant Messaging (IM) regularly (NCH, 2006). A Pew Internet Project (Lenhart & Madden, 2007) reported that over half of US adolescents, aged 12–17 were found to be using online social networking sites in 2006. Of these, 55% have created a personal profile, and 48% visit social networking sites daily or more often. Given the popularity of digital interactions for young people, the question arises as to whether educators should be considering the importance of these new technologies and their affordances for contributing to formal schooling. If so, what might schooling that exploits these technologies look like?

### **Chaos or Participatory Democracy in Society and Education?**

The increase in usage of new technologies by adolescents has led educational reformers to suggest that these technologies will impact strongly on ways of learning, content of learning and location of learning (Warshauer, 2007). Warshauer notes that we are in a transitional period, between a period in which print media were dominant and one that will be characterised in different, "post-

print” ways. Weston (1997), writing a decade earlier at the brink of this period of change, hypothesised that it was likely “that the existing social order is about to be challenged” (p. 196). He based this suggestion on the contrast between the ways in which we used the mass media of the day and the ways in which the Internet might be used. He noted that the Internet was used mainly for individuals to express themselves. In contrast other mass media presented content in a “nontransactional” way. It is for this reason that Weston believed that social change was likely on an unprecedented scale. As Weston so eloquently argued, “While expressions like ‘public involvement’ and ‘participative democracy’ are embedded in our rhetorical traditions, their unquestionable acceptability has always been conditional upon their equally unquestionable nonattainability” (p.197).

Somekh (2007) agrees that students’ interactions through the Internet are vastly different from the sort of interactions that occurred prior to its advent. She highlights its anarchic and highly individualistic nature. She argues that the characteristics of Internet usage by young people are the antitheses of the traditional activities, norms and customs operating in schools. However, while a robust adolescent online culture has emerged, at this point, little attention is given by formal education authorities to the opportunities that these technologies give students for sharing ideas, exchanging and debating views and making global connections (Lamb & Johnson, 2006). There is a growing incongruence between students’ informal and formal learning environments (Griffin & Aubusson, 2007) and a subsequent need to examine this shifting landscape. Further, the increased access to public networks and the growing opportunities for adolescents to produce, share and re-use artefacts with a global audience suggests a re-examination of the very nature of schooling, as indicated in Weston’s prescient paper (1997). Yet, this need to re-examine and perhaps reconceptualise the nature of schooling, learning and teaching has not impacted much on societal and systemic views which appear largely to be entrenched in industrial-age thinking (Nagy & Bigum, 2007). Like others, Nagy and Bigum suggest that the biggest impact that new technologies have and will continue to have, is on interactions rather than content. This impact thus raises the question of what role schools might have in the production and consumption of knowledge, given the change in the valuing of various concepts and skills.

Ovsiannikov and Monakhov (2007) note that it is possible to understand and judge a society by its educational system. They suggest that “a system of education . . . produces the ideas, socially significant ideals, worldview positions, and hopes that go together to make up the future society as a whole and the destiny of individuals” (p. 61). Conversely, Somekh (2007) suggests that the institution of schooling is “formed, maintained and sustained as much by the assumptions and routine behaviours of those who work within it as by the larger system which gives it legitimacy” (p. 169). Somekh goes further to claim that “teachers, parents

and the community — students even — can be said to be complicit in the unreformed institution of the school” (p.169). Attwell (2007) suggests that we understand education both in terms of the way society is portrayed in it and in terms of its assumptions about how we learn. He suggests that while industrial revolutions lead to far-reaching societal change, there is a substantial lag in such change. Indeed, Attwell argues that our current form of schooling and development of curriculum and pedagogy has its roots in the Industrial Revolution and that this paradigm is being challenged by the advent of the Web 2.0 read/write revolution. One of the major critiques that Attwell provides is that education systems have failed to recognise as valuable, any form of learning that occurs outside of the institution or its narrowly defined systems. Thus, “Education systems have failed to extend opportunities for learning outside the institutions and into wider layers of society at a widespread level” (p. 5).

It seems clear, therefore, that while governments have been considering ways to equip all schools with fast broadband connections, they are yet to propose ways to use this increased access effectively to enhance learning. A US study (Ito et al., 2008) investigated youth and young adults’ (ages 10–30) media use through large scale ethnographic studies. Their major findings are that the main usage of these new digital media is to extend friendships and interests, and that young people engage in peer-based, self-directed learning online. The researchers suggest that these activities have altered how adolescents learn and interact and suggest that there are major implications for educators and policy makers. Meanwhile, Somekh (2007) has drawn attention to the vast difference in impact on young people's lives of new technologies in and out of school. She notes that while usage out of school is high, and having a great impact on students’ lives, the opposite is true in schools. While Somekh cites studies and data that pertain to the turn of this century, the contrast between home use and school use is likely to be similar today.

Valkenburg, Peter, and Schouten (2006) provide a perspective on the benefits for adolescents of friend networking sites, and argue that feedback on their profiles impacted on their social self-esteem and well-being, both positively and negatively. The implication of their argument can be interpreted to be that educational systems need to be informed about the activities, values and dangers of Web 2.0 read/write sites to ensure that such systems are able to lay the foundations for the future well-being of the society. Important issues arising in this debate concern social responsibilities, global citizenship and curriculum applications, as well as questions of audience and new ways of forging community links with schools. As well, questions arise about the ethical and moral boundaries for teachers and students in these spaces, including duty of care issues, copyright, privacy and cyberbullying.

The potential relationship between Web 2.0 informal engagement and formal schooling remains an open question. Griffin and Aubusson (2007) argue that in school there has been “a lost opportunity to embrace the different learning experiences (that occur) . . . in authentic settings beyond the classroom.” In a similar vein, Hull and Schultz (2001) urge researchers to help bridge the vast gulfs that separate and continue to widen between children and youth who succeed in school and those who do not, by seeking a collaborative understanding of the relationship between formal classroom learning and the informal learning that flourishes in a range of settings outside school. Heppell (2000) in his development of the Notschool initiative (notschool.com) has developed a different model for learning for marginalised teenagers. In this model, students have access to computers at home, use mobile technologies for their learning and work in ways that are fundamentally different from the autocratic and hierarchical structures of schools. These students have succeeded in learning, which has also resulted in higher self-esteem (Somekh, 2007). Somekh suggests that this practical exemplar of learning with new technologies, underpinned by activity theory (Wertsch, 1998), McLuhan’s “the medium is the message” (1964), and Turkle’s (1995) work on identity and information and communication technologies (ICT), indicates that a radical revisioning of schooling is not only possible, it is necessary.

### **Future Schooling Scenarios**

This paper debates the potential of such revisioning with reference to OECD schooling scenarios. An OECD Future Schooling Scenarios paper (OECD, 2006) proposes a set of six possible scenarios for schools. We discuss these below and consider how the read/write characteristics of Web 2.0 fit or disrupt these scenarios. The OECD emphasises that the scenarios are not proposed as realities but are thinking devices that aim to sharpen distinctions, imagine possible alternatives and inform policy that may shape the future. There are three main categories — Status Quo, Re-schooling and De-schooling —each with contrasting alternatives.

In a *Status quo* future, schools attempt to maintain existing structures, procedures and practices by resisting change, resulting in mild perturbations and gradual evolution. In this future two extreme possibilities are identified. One scenario describes Bureaucratic School Systems, characterised by a centralised curriculum, management and governance dominated by accountability measures, predictable learning indicators readily and regularly assessed to promote efficiency of delivery and distribution of modest resources. An alternative prediction of the attempt to maintain status quo is the Meltdown Scenario characterised by teacher shortages and crisis management with increased centralisation to solve problems, and imbalances in resourcing.

The status quo model seems inconsistent with our analysis of Web 2.0 participation, access to information and social networking. The attempt to maintain status quo in schooling is likely to make schools increasingly irrelevant as sites of learning. In short, the status quo scenarios are unattractive and unsustainable as learning futures for a modern society. The inflexible, centralised, hierarchical nature of the status quo seems sharply at odds with the anarchy and unpredictable nature of Web 2.0 environments and the nimble thinking required for a knowledge-based society.

A recent report on Web 2.0 technologies (Crook, 2008), suggests that take-up of Web 2.0 tools for learning in schools depends on educational dispositions located within “systems of educational delivery, management and assessment that have been fashioned in harmony with such attitudes” (p. 6). If the influence of a growing adolescent digital culture is limited to the adoption of those aspects of Web 2.0 that are consistent with the prevailing policies and practices of current schooling then its impact is likely to be marginal and provide nothing remotely like the experience many adolescents enjoy in their Web 2.0 spaces. Furthermore, merely transplanting features of virtual adolescent cultures into formal school settings remains vexed and a formidable challenge (Pennycook, 2007).

Consequently, such an emaciated Web 2.0 — subservient to existing school mores, laws and rituals — cannot exploit its apparent potential for learning. Thus we question whether we should consider the adaptation of these technologies to serve the purposes of a status quo scenario and argue that adolescent Web 2.0 practices demand different scenarios for future schooling as indicated by the OECD (2006).

A *De-schooling* future predicts a dismantling of current school systems with a rise in dissatisfaction among key stakeholders and the middle classes. This provides for a continuum of potential alternatives ranging from cooperative learning networks to a competitive, consumer driven market system. A Learning Networks scenario is characterised by a learning organisation driven by individual and community interests, unpredictable patterns of knowledge acquisition and reduced measures of accountability. Resourcing of public institutions would diminish and teachers would be replaced by relatively informal networks where ICT would play a central role and attract major investments; small groups, the home and individual arrangements dominate. Alternatively, market led entrepreneurial providers emerge providing diverse means of accreditation, for consumers to purchase with a degree of public oversight and regulation.

The dismantling of schools as sites of education to be replaced by informal networks with universal access might seem attractive to some but there remain fundamental flaws in such anarchical dispersed mechanisms for education and

learning. The absence of schools as institutions and their replacement with informal networks and ad hoc patterns of learning arising at need seems broadly consistent with the preceding analysis of Web 2.0 patterns of engagement among adolescents. However a mere consistency does not of itself imply it is an ideal state or recommended scenario.

The existence of a “second digital divide” (Somekh, 2007) illustrates that members of society have unequal access to technology and varied forms of participation in Web 2.0 activity in particular, “according to the cultural capital available to them” (p.173). Warschauer’s (2007) argument that the contribution of at-home computer use to education is highly variable with high socio-economic status learners benefiting more than those from low socio-economic status background underlines this point. Such a gap is morally intolerable. We are all the worse off if some of us are denied the tools they need to succeed in life; it is also economically intolerable if the benefits extend only to individuals with privileged access (Ogilvy, 2006). A schooling scenario with no place for schools, per se, removes one (albeit flawed) mechanism with capacity to provide educational access across socio-economic, racial and gender barriers. Consequently, any future learning scenario that aims to be broadly inclusive requires schooling that provides significant opportunities for digital learning and Web 2.0 engagement. Similarly a market-driven schooling system is likely to favour those with consumer power, inevitably high socio-economic status groups and the middle classes.

The collaborative ideals and universal access embedded in de-schooling scenarios are well matched to Web 2.0 possibilities. The consequences of de-schooling for the disadvantaged, however, raise critical concerns about its attractiveness as a schooling future.

*Re-schooling* predicts schools as either core social centres or as highly focused learning organisations. In both, schools are high status, highly valued organisations with teachers as respected professionals. However the school as core social centre emphasises values and citizenship rather than cognitive outcomes which are more readily addressed through informal systems. ICT is used extensively particularly for communication and in enhancing a sense of community. Leadership is distributed with local decision making. As learning organisations, schools are driven by a knowledge management rather than social agenda. Here extensive use of new media and ICT supports knowledge access and exchange in an environment that values small, relatively independent teams engaged in educational innovation.

Re-schooling scenarios retain a place for schools but address key problems of relevance and shift the role either towards social community roles and/or towards that of a learning organisation with a focus on knowledge production and

exchange. In the context of re-schooling it is useful to consider the “how” and “where” paradoxes outlined by Warschauer (2007, p. 44–43). The “how paradox” is that learning autonomously will be critical in a digital future but, paradoxically, strong teacher mentoring is required for students to achieve this autonomy. Similarly, the “where paradox” suggests that at a time when informal and out-of-school learning has become more powerful and ubiquitous so too formal education is having a greater impact on people’s lives and on workforce preparation. Therefore it seems that schools as institutions with professional teachers capable of facilitating student learning and capacity building will have a critical role in future learning, digital learning and learning in Web 2.0 spaces.

A consistent theme emerging from studies of Web 2.0 participation indicates that the types of activities are variable ranging from expansive creative use to descriptions of proposed and past social interactions; from extensive access among high SES adolescents to negligible access by those on the other side of the digital divide; from genuinely powerful learning tools to influential tools of social interaction and friendship groups. If there is to be a scenario where Web 2.0 features in providing a richer learning experience for all then it is likely to be within the broad parameters of a re-schooling scenario. Here the school as institution sustains social networks; facilitates the capability of learners for autonomy and independence, with an open unpredictable curriculum that addresses issues about access and equity; and thinking that draws on transdisciplinary knowledge.

Ideally school in this scenario would contribute to an open knowledge-building community where control and choice about what and how learning occurs is vested in the adolescent learner rather than determined by distant bureaucracy. This future would enable Attwell’s plea for a “basic paradigm shift from learners engaging with institutional provision and procedures to the institution engaging with the learner” (2007, p. 5) In such a future, Somekh suggests, schools might welcome being “fundamentally challenged by the destabilising impact of ICT on concepts like knowledge, teaching, the disciplines and rationality” (2007, p. 170) because schools are revisioned — not as objects of yesterday’s industrial revolution reproducing society and a workforce for today, but as sites for strong framing, creation and critique of knowledge for tomorrow. Schooling exists not as a process for stagnation and reproduction but as a social tool for leading learning with innovation driving informed, sensitive social transformation and knowledge production.

## Implications and Conclusions

Policy discussion about schooling is rarely informed by a serious appreciation of the nature of childhood or youth in today's society, perhaps because this is regarded as a given for all practical purpose. But it is neither given nor unchanging; it would be well for educational policies were more fully informed by a rounded appreciation of the lives of today's young.

(Istance, 2000, p. 39)

A serious appreciation of the cultures, contributions, needs and characters of young people requires a deep understanding of adolescents' current and emerging online practices, their benefits and pitfalls; their implications for formal education; and the development of guidelines for the management and uptake of associated social technologies in schools. The potential for digital technologies to contribute to a useful, productive and engaged citizenry is self-evident. Current growth and use of social technologies is driving innovation in many areas of human endeavour. The smart use of such technologies requires workplaces, industries and education that embrace, exploit and invigorate young people's productive engagement with, and knowledge of, cutting edge technologies. A fundamental way to achieve this is by capitalising on the massive engagement of adolescents with technologies that are intrinsically attractive to them.

The implications for learning, of a phenomenon in which users have unprecedented access to self-expression, global audiences and public spaces, are undeniable. Patterns of behaviour, interaction and access in Web 2.0 contrast with the hierarchical and authoritarian context of current formal schooling. Given the increase in usage of new digital read/write spaces by young people, if nations wish to have schooling systems that are relevant and responsive to new developments, it is essential to develop policy and debate about the value of such technologies for changing our notions of what schools should look like as institutions of learning. In this context then, it is noteworthy that in a study of education policy leaders' future visions of schooling (Cogan, 2004) the schooling scenario that was considered most desirable was that of a (re-schooling) Learning Organisation. However, the scenario that was predicted as most likely was a Bureaucratic System (status quo). If this prediction proves correct then school systems will have increasingly and dramatically failed to capitalise on new online technologies.

Meanwhile, adolescents are likely to show ever increased engagement in their use of these ubiquitous technologies to network and express themselves. From a schooling perspective, there is an urgent need to find out where new boundaries have emerged and to develop strategies for exploiting the fluid nature of this second generation of web-based services. From a broader educational perspective,

the use of Web 2.0 technologies could provide an alternative to the dominant culture of schools and by implication a critique of current policy and practice. Educational systems need to generate innovative learning opportunities for adolescents who operate in an online world, which is informal and social and which potentially provides them with unlimited voice, access and power. We have a digital generation of adolescents with capability in this area but young people's creativity and expertise, as exhibited in their informal use of Web 2.0 spaces, remains largely untapped and isolated from formal education. Hence, their contributions to national innovative capabilities are dispersed and meandering. Like Somekh (2007), we suggest that it is fruitful for educators to "use their sociological imagination to play a leadership role in scenario building to assist policy makers in the transformation of the education system" (p. 177).

### References

- ACMA. (2007). *Media and communications in Australian families 2007: Report of the Media and Society Research Project*. Melbourne: Australian Communications and Media Authority: Commonwealth of Australia.
- Attwell, G. (2007). *Web 2.0 and the changing ways we are using computers for learning: What are the implications for pedagogy and curriculum?* Retrieved March 26, 2009, from [www.elearningeuropa.info/files/media/media13018.pdf](http://www.elearningeuropa.info/files/media/media13018.pdf)
- Australian Bureau of Statistics. (2008). *Household use of information technology, Australia, 2007–08*. Canberra: Australian Bureau of Statistics.
- Cogan, J. J. (2004). Schooling for the future in United States of America: Educational policy at the crossroads. *International Journal of Educational Research*, 41, 574–583.
- Crook, C. (2008). *Web 2.0 technologies for learning: The current landscape — Opportunities, challenges and tensions*. UK: BECTA. Retrieved January 27, 2009, from [http://partners.becta.org.uk/upload-dir/downloads/page\\_documents/research/web2\\_technologies\\_learning.pdf](http://partners.becta.org.uk/upload-dir/downloads/page_documents/research/web2_technologies_learning.pdf)
- Gefer, A. (2006). This is your space. *New Scientist*, 191(2569), 46–48.
- Griffin, J., & Aubusson, P. (2007). Teaching and learning science and technology beyond the classroom. In V. Dawson & G. Venville (Eds.), *The art of teaching primary science* (pp. 216–232). Sydney: Allen & Unwin.
- Heppell, S. (2000). *Notschool.net. Literacy Today*, 25. Retrieved January 27, 2009, from <http://www.literacytrust.org.uk/Pubs/heppell.html>
- Hull, G., & Schultz, K. (2001). Literacy and learning out of school: A review of theory and research. *Review of Educational Research*, 71(4), 575–611.
- Istance, D. (2000). The OECD/CERI Schooling for tomorrow program: Major trends and future scenarios. *Pacific Asian Education*, 13(1), 38–48
- Ito, M., Horst, H., A., Bittanti, M., Boyd, D., Herr-Stephenson, B., Lange, P. G., et al. (2008). *Kids' informal learning with digital media: An ethnographic investigation of*

- innovative knowledge cultures*. Retrieved January 27, 2009, from <http://digitalyouth.ischool.berkeley.edu/report>
- Lamb, A., & Johnson, L. (2006). Want to be my friend? What you need to know about social technologies. *Teacher Librarian*, 34(1), 55–57.
- Lenhart, A. & Madden, M. (2007). *Pew Internet and American Life Project*. Retrieved March 27, 2009, from [http://www.pewinternet.org/~media/Files/Reports/2007/PIP\\_SNS\\_Data\\_Memo\\_Jan\\_2007.pdf.pdf](http://www.pewinternet.org/~media/Files/Reports/2007/PIP_SNS_Data_Memo_Jan_2007.pdf.pdf)
- McLuhan, M. (1964). *Understanding media*. London: Oxford University Press.
- Nagy, J., & Bigum, C. (2007). Bounded and unbounded knowledge: Teaching and learning in a Web 2 world. *Turkish Online Journal of Distance Education*, 8(3), article 5. Retrieved March 19, 2009, from [http://tojde.anadolu.edu.tr/tojde27/articles/article\\_5.htm](http://tojde.anadolu.edu.tr/tojde27/articles/article_5.htm)
- NCH. (2006). *Get I.T. safe: Children, parents and technology survey 2006*. Retrieved March 27, 2009 from <http://image.guardian.co.uk/sys-files/Education/documents/2006/07/17/NCHreport.pdf>
- OECD. (2006). *Centre for Educational Research and Innovation (CERI) — The OECD schooling scenarios in brief*. US: OECD Publishing. Retrieved January 27, 2009, from [http://www.oecd.org/documentprint/0,3455,en\\_2649\\_39263231\\_2078922\\_1\\_1\\_1\\_37455,00.html](http://www.oecd.org/documentprint/0,3455,en_2649_39263231_2078922_1_1_1_37455,00.html)
- Ogilvy, J. (2006). Education in the information age: Scenarios, equity and equality. In *Schooling for tomorrow. Think scenarios, rethink education* (pp. 21–38). Paris: OECD.
- O'Reilly, T. (2005). *What Is Web 2.0?* O'Reilly Network. Retrieved January 25, 2009, from <http://www.oreillynet.com/pub/a/oreilly/tim/news/2005/09/30/what-is-web-20.html>
- Ovsiannikov, A., & Monakhov, S. (2007). The social effectiveness of Internet education. *Russian Education and Society*, 49(3), 61–86.
- Pennycook, A. (2007). *Global Englishes and transcultural flows*. London: Routledge.
- Somekh, B. (2007). Taking the sociological imagination to school: An analysis of the (lack of) impact of information and communication technologies on education systems. *Technology, Pedagogy and Education*, 13(2), 163–179.
- Turkle, S. (1995). *Life on the screen: Identity in the age of the Internet*. London: Phoenix.
- Valkenburg, P., Peter, J., & Schouten, A. (2006). Friend networking sites and their relationship to adolescents' well-being and social self-esteem. *Cyberpsychology & Behaviour*, 9(5), 584–590.
- Warschauer, M. (2007). The paradoxical future of digital learning. *Learning Inquiry*, 1(1), 41–49.
- Wertsch, J. (1998). *Mind as action*. New York: Oxford University Press.

Weston, J. (1997). Old freedoms and new technologies: The evolution of community networking. *The Information Society*, 13(2), 195–201.

Zimmer, M. (2008). Critical perspectives on Web 2.0. *First Monday*, 13, (3–13).