

See discussions, stats, and author profiles for this publication at: <https://www.researchgate.net/publication/275647628>

The educational landscape of the digital age: Communication practices pushing (us) forward

ARTICLE *in* RUSC. UNIVERSITIES AND KNOWLEDGE SOCIETY JOURNAL · MAY 2015

DOI: 10.7238/rusc.v12i2.2440

CITATION

1

READS

130

9 AUTHORS, INCLUDING:



Linda Castañeda

University of Murcia

77 PUBLICATIONS 96 CITATIONS

SEE PROFILE



César Coll

University of Barcelona

151 PUBLICATIONS 662 CITATIONS

SEE PROFILE



Punya Mishra

Michigan State University

98 PUBLICATIONS 2,943 CITATIONS

SEE PROFILE

The educational landscape of the digital age: Communication practices pushing (us) forward

**Janaina Minelli de Oliveira¹, Danah Henriksen², Linda Castañeda³, Marta Marimon⁴,
Elena Barberà⁵, Carles Monereo⁶, César Coll⁷, Jabari Mahiri⁸ and Punya Mishra⁹**

1. Rovira i Virgili University (URV), Spain | janaina.oliveira@urv.cat

2. Michigan State University (MSU), USA | henrikse@msu.edu

3. University of Murcia (UM), Spain | lindacq@um.es

4. University of Vic (UVic), Spain | marta.marimon@uvic.cat

5. Open University of Catalonia (UOC), Spain | ebarbera@uoc.edu

6. Autonomous University of Barcelona (UAB), Spain | carles.monereo@uab.es

7. University of Barcelona (UB), Spain | ccoll@ub.edu

8. University of California (UC), USA | jmahiri@berkeley.edu

9. Michigan State University (MSU), USA | punya@msu.edu

Submitted in: November 2014

Accepted in: February 2015

Published in: April 2015

Recommended citation

de Oliveira, J. M., Henriksen, D., Castañeda, L., Marimon, M., Barberà, E., Monereo, C., Coll, C., Mahiri, J., & Mishra, P. (2015). The educational landscape of the digital age: Communication practices pushing (us) forward. *RUSC. Universities and Knowledge Society Journal*, 12(2), pp. 14-29. doi <http://dx.doi.org/10.7238/rusc.v12i2.2440>

Abstract

This paper identifies trends in the emerging models of knowledge production available in our society. We suggest it is crucial not only to be aware of these emerging models but also to be open to opportunities and possibilities that may still develop. We consider how people may express different levels of solidarity and commitment to these trends and models in their information consumption and distribution processes. We discuss how educators are now engaging in profound pedagogical renewal by expressing deeper levels of solidarity and commitment to knowledge production and educational projects through professional and personal interactions. These interactions are producing pedagogical models that allow both teachers and learners to become knowledgeable while simultaneously breaking away from domain conventions. These bottom-up pedagogies foster creativity, collaboration and the use of new digital tools. They are driven by learner interests and, as such, have the potential to bring the joy back into the learning process. Finally, we argue that emerging models of knowledge construction mediated by ICT provide new cultural landscapes and ecologies of learning that disrupt traditional inscriptions of individual identities and racial-cultural affinities.

Keywords

knowledge production, technology, learner identity, solidarity, social practices, bottom-up pedagogies

El panorama educativo de la era digital: prácticas comunicativas que (nos) impulsan hacia adelante

Resumen

En este artículo, se identificarán algunos modelos y tendencias emergentes en la producción de conocimiento. Se hará hincapié especialmente en cómo los individuos implicados en los procesos de consumo y de distribución de la información expresan diferentes niveles de solidaridad y de compromiso, y se sugerirá que es crucial que las personas no solo conozcan estos procesos, sino que también estén abiertas a otros modelos, oportunidades y posibilidades que, dadas las condiciones sociotecnológicas y comunicativas actuales, aún deben desarrollarse. Se abordará con especial interés el ámbito de la educación, puesto que se entiende que los educadores están participando de forma comprometida en una profunda renovación pedagógica a través de proyectos compartidos cimentados en interacciones profesionales y personales facilitadas por las redes. Estas interacciones favorecen la emergencia de modelos pedagógicos que permiten a profesores y a alumnos convertirse en expertos al mismo tiempo que rompen con muchas convenciones epistemológicas clásicas. Estas pedagogías generadas de abajo arriba no solo fomentan la creatividad y la colaboración, y se sustentan en el uso de nuevas herramientas digitales, sino que las promueven e impulsan los intereses del alumnado, y por ello, tienen el potencial suficiente para devolverle la alegría al proceso de aprendizaje. Por último, se argumentará que los modelos emergentes en la construcción del conocimiento a través de las TIC ofrecen nuevos paisajes culturales y ecologías de aprendizaje que trastocan las inscripciones tradicionales de las identidades individuales y las afinidades raciales y culturales.

Palabras clave

producción de conocimiento, tecnología, identidad, solidaridad, prácticas sociales, pedagogías emergentes

Introduction

It is often said that the 21st century, characterized by changes produced by globalization and technological advances, is a critical moment that obliges us to rethink everything that has gone before (Mishra, Koehler, & Henriksen, 2011). However, it is important to note that we are at the early stages of the 21st century. Clearly, technological change is not going to stop so we must be humble in the kinds of predictions we make. This is especially important because the meaning of a tool lies not only in its affordances but also in the broader cultural context within which it functions (Csikszentmihalyi, 1990). In other words, in order to understand how the future will play out we must be able to go beyond the surface of what people can do with the tools and consider their instantiation within a broader context.

In this paper we explore some of the emerging models of knowledge construction. We aim to explain some of the key issues concerning how the communication practices of the digital age both design and are designed by emerging forms of knowledge production and learning practices. Specifically, we suggest that as educators we need to focus on five broad themes or ideas that will be played out in the future. These are:

1. New models of knowledge construction are emerging.
2. These new models of knowledge construction are situated and contextualized within social interactions that link the individual, the group and the community at large within and across different levels of solidarity.
3. The above factors allow for the emergence of bottom-up pedagogies.
4. The multi-level bottom-up approaches to knowledge construction also have the potential for creative boundary breaking through the development of new possibilities that push the limit on traditional pedagogical structures by foregrounding user-driven creativity.
5. Finally, and perhaps most importantly, the new possibilities provided by digital and global networking technologies enable the liquefying of racial-cultural identities in ways that were previously impossible.

In the rest of this paper we will explore and discuss each of these themes in greater detail.

Emerging models of knowledge construction

Today we live in a liquid society, as defined by Bauman (1991), that is characterized by constant change, uncertainty and instability. Identifying models of knowledge construction to explain actual communication practices in full complexity is an insurmountable task. However, several trends in the scientific literature as well as in expert reports and innovation projects can be identified.

Explanatory models of knowledge construction now integrate the foundations of previous models that were based on cognitive variables. This moves us towards modern theories of a social and intrapsychological nature in which frameworks that acknowledge the importance of ICTs are generated. Examples of such approaches are the model of Knowledge Building (Bereiter, & Scardamalia, 1993), the Expansive Educational Transformation-through ICTs model (Batane, Engeström, Hakkarainen, Newnham, & Virkkunen, 2012), the Spiral Model of Knowledge Creation (Nonaka, & Takeuchi, 1995) and the Dialogic learning model proposed by Paavola and Hakkarainen (2005, 2009). These go beyond models that focus on the individual transmission of information towards multidirectional communication between educators and learners. As suggested by L.S. M. Bakhtin (1979) and Vygotsky (1979), social

interaction through dialogue is at the heart of knowledge construction practices. However, much social dialogue today is mediated by ICTs and can connect individuals, groups and communities with shared or overlapping learning and communicative objectives.

Emerging theories of knowledge construction do not focus exclusively on formal education but account for a new ecology of learning experiences based on the ubiquity of the learning experiences enabled by ICT. There is broad consensus concerning the radical change that has taken place in recent decades with respect to the role of learning in our lives and across human society (Banks et al., 2007; Collins and Halverson, 2010; JISC, 2012). These changes, combined with the new economic, social, political and cultural landscape of the Information Society, have been known to create exponential shifts in the new ecology of learning (Ito, & al., 2012). The discussions cited here share the idea that learning is a life-long phenomenon (Banks et al., 2007). The growing acceptance of this idea has led to the concept of Learning Spaces (Leander, Phillips, & Taylor, 2010), bringing about a vision of education in which learning is no longer limited first and only to a single space (like schools) or to formal education. Above all, it has shifted the focus of interest towards the study of learning trajectories (Biesta et al., 2011) and learning pathways through scenarios or contexts of activity (Erstad, & Sefton -Green, 2013).

Personal uses of ICTs and learner identity are gaining strength in explanatory models of knowledge construction. People participate in informal activities and spaces that take advantage, to a greater or lesser extent, of the opportunities and resources provided for learning. These processes are characterized by deeply subjective experiences of learning that result from participation (Coll, 2013). Certainly, the skills and competencies involved in the formation of a competent learner are many and varied but at the base of all these is the learner's willingness to assume and develop an Apprentice Identity (Coll, & Falsafi, 2010; Falsafi, 2011).

Levels of solidarity in knowledge production, consumption and distribution dynamics

Theories of learning now acknowledge the importance of social interactions between individuals acting in a social world, as being influenced by the opportunities offered by digital technologies. Authors such as Crook (1996), Dillenbourg (2000) Harrasin et al. (2000) and Baker (2003) are important references in the field of collaborative learning mediated by technologies. The theory of situated cognition adds to this discussion, taking as a benchmark the sociocultural perspective of Vygotsky (1978) and, more recently, the work of Rogoff (1993), Bereiter (1997) and Wenger (2001), to name just a few of the best-known authors in the field of education. Social cognition problematizes learning as an activity located in a context that gives the process meaning. All knowledge acquisition is therefore contextualized in some form of social activity. The emphasis is put on meaning situationality, the skills and the strategies needed to interact with others. Learning is taken as a social, collaborative process that is situated, and therefore ordered and nurtured, at the heart of a community, its value systems, goals and participation dynamics. Knowledge acquisition is regarded as a process of social participation. This process is called legitimate peripheral participation as social actors, moving from the periphery towards the center of the community, become more active and more committed to the community culture. New participants progressively assume new roles. According to Lave and Wenger (1991), learning is the result of being part of the community. The authors develop the concept of community of practice to highlight the importance of work as a link between the individual and the community. Communities themselves have the function of legitimizing individual practices.

When we talk about current and emerging trends in the construction of knowledge through ICT, we can identify three progressive and often overlapping levels of solidarity and commitment that link individuals, groups and communities. First is the individual, conscious of his or her own needs and responsible for his or her own personal learning project. Second is the group, which offers individuals the opportunity for interaction with others, responds to their needs and is the beneficiary of information-sharing and feedback processes in knowledge construction. Third is the community, which establishes the means, values and goals shared by the collective. At this level, interactions occur in the framework of a joint project to build knowledge collaboratively in processes that transcend individuals and groups.

At the first level of solidarity we find individuals who are able to recognize, from both the personal and professional perspectives, their own learning needs throughout life and to organize their own personal learning and work environments. They make connections between what they learn, how they learn, and whom they learn with and from. In this sense, ICTs provide individuals with tools for information management and communication that allow them to constantly adapt their learning and knowledge production processes. As examples, we can see uses of learning portfolios and personal learning environments (PLE – Dabbagh, & Kitsantas, 2012; and Castañeda, & Adell, 2013). What is relevant here is not simply the technology used to construct these spaces but all the methodological approaches and actual design processes with important educational and institutional implications.

At the second level of solidarity we find group forms of interaction that promote joint construction of knowledge. ICTs are the medium that allows the creation of communication systems, websites or group editable documents, virtual discussion forums, chat rooms and video conferencing for content negotiation, etc. This introduces new ways of working based on the benefit of feedback for achieving common learning or knowledge production objectives. It is important to bear in mind, however, that technology alone will not create spaces for learning or communication. Educational strategies that promote collaborative learning in environments mediated by technology (CSCL) are necessary.

At the third level of solidarity we find the community. Here, both groups and individuals offer their knowledge to the collective, while benefiting from a global project. Participation is not exclusively directed by individual compensation but by an underlying will to contribute. One example is Wikipedia. We can use Wikipedia to find information at a given moment (first level of solidarity) or we can decide to provide/correct/improve its information (second level of solidarity). However, if we approach Wikipedia from the third level of solidarity, we: value the potential of the project as a tool for the joint construction of knowledge and social participation on a global scale; support it either intellectually or economically; and help organize and enhance strategies users can apply to provide/correct/improve information.

The three levels of solidarity are not mutually exclusive since they can share common aspects. People involved in emerging trends of knowledge production will be participating in different endeavors and expressing different levels of solidarity depending on their goals and values. Decisions are always contextual and situated, and always generate commitment to learning and knowledge construction projects. This highlights the complexity of processes mediated by technology, where individuals and groups of individuals, both in formal and non-formal contexts, express different levels of solidarity and commitment to the project on which they collaborate. These collaboration practices break geographical, time and even cultural barriers. Educational projects using ICT should take into account the social dimension of learning with the different levels of solidarity and commitment described above.

Bottom-up pedagogies

Taking advantage of the opportunities for creating knowledge together is more than a possibility in itself and becomes a condition of knowledge production dynamics. The notion of learning and knowledge as “something” fixed that can be collected, stored and accumulated individually is becoming obsolete. Learning happens in communities. However, communities are not just meetings of individuals but gatherings of potentials in action – networks where learning and knowledge remain, flow, grow, change and move through and by people. There are now a number of theoretical approaches that attempt to provide answers to the challenges posed to education in the face of this new scenario.

Beetham, McGill and Littlejohn (2009: 12) drew up a list of “new pedagogies” that included 2.0 Learning, 2.0 counter evidence Learning, Connectivism, Communities of Enquiry, the Practical Inquiry, Academic Apprenticeship, e-Learning and e-Pedagogy. Attwell and Hughes (2010) have added to this list Constructivism, Communities of Practice, Activity Theory, Vygotsky and Social Constructivism, Scaffolding Learning, Boundary Objects, Models for a Pedagogic Toolkit, Curriculum Development and Rhizomatic Knowledge, Discourse, Collaboration and Meta Cognition, Bricolage and Learning styles. Following the perspective of Snowden and Boone (2007) on complexity, we could say that this is a really –and impressively– complex environment where pedagogical “solutions” and “answers” cannot be prescribed or even discovered. The pedagogies that respond to new knowledge construction dynamics are “emerging” –as is learning (Williams, Karousou, & Mackness, 2011).

These emerging pedagogies have been defined as “the set of pedagogical approaches and ideas, not yet well systematized, that arise around the use of ICT in education and attempt to bring out its communicative, informational, collaborative, interactive, creative and innovative potential in the context of a new culture of learning” (Adell, & Castañeda, 2012, p. 15). Most are proposals developed by educators who are engaged in collaborative environments of practice and, though loosely associated with professional networks, are intensively participative in both discussions and the exchange of experiences on social networking sites such as Twitter and Facebook or on specific contextualized networks.

The new models of knowledge production presented allow for a change of paradigms in pedagogical approaches. Practitioners (teachers and educators) look for ways of answering new environmental needs through dialog and participation in communities of practice. They engage in profound pedagogical renewal, expressing, through their personal and professional communicative practices, deep levels of solidarity and commitment to knowledge production. Bottom-up pedagogies become influential in pervasive ways, opening space for sharing creative solutions and the critical re-usage of ideas.

Breaking the knowledge boundaries by which we live

In 21st century learning, educational scholars (and popular culture at large) often suggest that because of new digital technologies “everything has changed.” And yet, when we consider the fact that timeless issues of pedagogy and of human thought and learning remain the same, it is clear that in some ways “nothing has changed”. We suggest that both are occurring at the same time – there is a dual reality here in which nothing has changed and yet everything has changed (Kereluik, et al., 2012). It therefore becomes important to consider ways of thinking that

are flexible and adaptable and that promote new growth within these expansive environments. It has been noted that there is a “zone of possibility” in smart uses of technology that focuses not just on the technology but keeps humanistic concerns front and center (Dirkin, & Mishra, 2010).

Of specific interest to us in these aspects of 21st century learning is the idea of creativity. One thing that is clear from the research on creativity is that creativity requires a dual view of the world – a strong grounding in a discipline and an ability to break out of the discipline (Root-Bernstein, 1999; Mishra, Henriksen, & the Deep Play Research Group, 2012). Clearly, this view demands new pedagogical structures that respect nonconformity and the urge to explore for the sake of exploration, to value risk-taking and learning from failure and error. In fact, it has been argued that, in contexts characterized by change, fear of failure may actually be the greatest barrier to learning (Amabile, 1996). In this context, a tolerance for risk combined with an ability to re-signify error as not being the “end of the world”, so to speak, but rather as a stepping-stone to future success is of critical importance (Clifford, 1991; and Dewett, 2007).

The biggest task in getting teachers and students to be creative involves helping them see the world as something one can play with, that most of the things we think of as “rules” are actually conventions created by other humans that can be manipulated and changed (Mishra, Henriksen, & The Deep-Play Research Group, 2012). We would argue that the goals require us to construct environments that encourage people to see the world with new eyes and be opportunistic to the potential for these new tools to help us engage with the world in innovative ways.

What we need is what has been described as an “(in)disciplined” pedagogy (Mishra, Henriksen, & the Deep-Play Research Group, 2012; 2013). This concept of “(in)disciplined” pedagogy suggests that being creative in a given domain requires being both knowledgeable and skilled in the domain or discipline while also being able to break away from the domain’s conventions. Research shows that some of the most creative people (in both Sciences and Arts) have widely varied and interdisciplinary interests that are key to their creativity in their professional field. This is a dual focus on developing disciplinary ways of thinking while being flexible in bringing in ideas from outside the discipline. This suggests the value of developing curricula that break traditional boundaries and are driven more by the interests of the learner (and of the teacher) than the typical top-down, lock-step, standard curricular structures we have become stuck within (Giroux, & Schmidt, 2004).

It is important to emphasize that, though the tools we have today are powerful and have great potential for transforming pedagogy, it is far more important to rethink the contexts within which these tools are used. So, when we think about developing learning communities, the availability of social media and user networks is a great boon. Such environments tend to be more bottom-up and driven by user and learner interest, thus fostering collaboration and creativity. As time goes by, these tools will have lower barriers to entry, making them easier to access and use.

These new learning environments, as described above, foster creativity and collaboration through bottom-up pedagogies and new digital tools and are driven by learner interests. They therefore have the potential to bring joy back into the learning process. Successful scientists and professionals often speak about the aesthetic aspects of learning – similar to how artists speak about their work (Root-Bernstein, 1999; 2003). We believe that new tools will truly be able to transform how we develop and apply knowledge in the future.

Liquefying racial-cultural identities

As digital texts and tools enable individuals to engage the world in a multitude of innovative ways, their use also works to liquefy “solid” forms of racial-cultural identification and organization that earlier forces of modernity attempted to inscribe (Bauman, 1991). In their solid form, hierarchies of power and privilege define individuals within constructed (and constrained) racial, cultural, and language categories as part of a larger project of division, domination, and control. Emerging models of knowledge construction mediated by ICT provide new cultural landscapes and ecologies of learning that disrupt traditional inscriptions of individual identities and racial-cultural affinities.

Learning with digital texts and tools “involves taking on and playing with identities in such a way that the learner has real choices (in developing virtual identities) and ample opportunity to mediate the relationship between new identities and old ones” (Gee, 2003, p. 208). As digital and virtual spaces for participatory learning allow for choice and play with new identities, these liquefying processes dissolve the logic and limits of solid, static forms of racial-cultural identification. The term “micro-culture” can be used to indicate the distinct set of practices, prerogatives, and perspectives engaged in by an individual in a specific digitally mediated learning context. These contexts permit multisensory, multidimensional, interactive cyber experiences with an almost infinite range of written, audio, visual, and animated texts. Learners do not just consume and respond to digitally accessed messages and images, they also produce and propagate meanings and representations of their own (including representations of themselves). These meanings can challenge or counter the social constructions of identity from other societal institutions. The re-mixing practices that are characteristic of digital production lend themselves to experimenting, analyzing and performing different realities and different positioning of individual selves (Knobel and Lankshear, 2008; Mahiri, 2011), and the use of online spaces and tools for identity exploration, formulation and expression are pervasive for many learners.

Following authentic, immediate, and customized interests, learners elude local structures of space and place and virtually participate in affinity groups in which they are “bonded primarily through shared endeavors, goals, and practices and not shared race, gender, nation, ethnicity, or culture” (Gee, 2003, p. 197). Aided by avatars and digitally distanced from stereotypes embodied in physical contexts, racial identities and categories can become more ambivalent, if not entirely indeterminant. Identities are constructed through learning and participation in communities of practice (Lave, & Wenger, 1991). However, as a learner moves from the periphery towards the center of a virtual community, the expert may be embedded in the material intelligence of the digital device that mediates the group’s interactions and activities. Essentially, the Internet and other digitally mediated, virtual practices have significantly transformed how 21st century learners leverage online communities and digital texts and tools for exploring, expressing and transforming personal or cultural identities and affinities.

Conclusion

In this paper we have identified five key aspects of learning in this new millennium. We do not suggest that these are the only important issues to consider but we do believe that these five aspects capture key themes that we as educators need to consider as we look to the future. To summarize, we suggest that the forces of technology-change

and globalization, combined with increasing ease of use and access to these technologies, have implications for knowledge construction that are situated at different levels of solidarity and commitment (individual, group and community). These new forms of interaction and knowledge-construction allow for the emergence of bottom-up pedagogies that can creatively disrupt extant boundaries and, through this, lead to the liquefying of racial and cultural identities.

We therefore suggest that it has become essential to acquire skills that enable people to make best use of the opportunities, resources and tools available to them for learning in a given context. Educators should direct their efforts towards structuring learning environments in which solidarity and commitment are nurtured rather than hindered. In this way, the knowledge-production goals of the individual, the group and the community are achieved. A key issue is how to promote legitimate peripheral participation that empowers people to move from the periphery towards the center and become more active and more committed to the culture of the community.

The development of ICTs and new possibilities for social networking have enabled educators to engage in collaborative environments of practice, participating in the discussion and exchange of experiences that favor profound pedagogical renewal. Many educators now engage in bottom-up pedagogies that allow them to express, through their communicative practices, deep levels of solidarity and commitment to knowledge-production and educational projects. This further promotes creative solutions and fosters the critical re-usage and re-purposing of ideas. This movement creates space for pedagogical structures that are characterized by nonconformity, exploration, risk-taking and positive views of error and fun in learning. It also liquefies "solid" forms of racial-cultural identification and organization as communicative practices are driven by authentic, immediate, and customized interests. This allows participation in affinity groups that elude local structures of space.

As the educational context of the 21st century expands and shifts, it becomes increasingly important for educators to make sense of the participation, interaction and collaboration practices that move us forward. In this paper we have explored some of the emerging models of knowledge construction and suggest that it is crucial not only to be aware of them but also to be open to the opportunities, possibilities and new models that may still develop in this context.

References

- Adell, J., & Castañeda, L. (2012). Tecnologías emergentes, ¿pedagogías emergentes? In J. Hernández, M. Pennesi, D. Sobrino, & A. Vázquez (Eds.), *Tendencias emergentes en educación con TIC* (pp. 13-32). Barcelona: Asociación Espiral, Educación y Tecnología.
- Amabile, T. M. (1996). *Creativity in context*. Boulder, CO: Westview Press Harper Collins Publishers.
- Attwell, G., & Hughes, J. (2010). Pedagogic approaches to using technology for learning: Literature review. Wales: Pontydysgu: Lifelong Learning UK (LLUK). Retrieved from <http://dera.ioe.ac.uk/2021/1/harnessing-technology-literature-review-january-111.pdf>
- Baker, M. J., Quignard, M., Lund, K., & Séjourné, A. (2003). Computer-supported collaborative learning in the space of debate. In B. Wasson, S. Ludvigsen, & U. Hoppe (Eds.), *Designing for Change in Networked Learning Environments: Proceedings of the International Conference on Computer Support for Collaborative Learning 2003*, pp. 11-20. Dordrecht: Kluwer Academic Publishers.

- Bakhtin, M. M. (1979). *[The] Aesthetics of Verbal Art*. Moscow: Iskusstvo.
- Banks, A. et. al. (2007). *Learning In and Out of School in Diverse Environments: Life-Long, Life-Wide, Life-Deep. The Learning in Informal and Formal Environments Center*. University of Washington, Stanford University, and SRI International. Retrieved from <http://education.washington.edu/cme/cenpub.htm>
- Batane, T., Engeström, Y., Hakkarainen, K., Newnham, D., & Virkkunen, J. (2012). Dilemmas of promoting expansive educational transformation through ICTs in Botswana. International Society of the Learning Sciences. Proceedings of the 10th international conference of the learning science.
- Bauman, Z. 1991: *Modernity and ambivalence*. Ithaca, N.Y.: Cornell University Press.
- Beetham, H., McGill, L., & Littlejohn, A. (2009). Thriving in the 21st century: Learning literacies for the digital age (LLiDA project). Glasgow: the Caledonian Academy, Glasgow Caledonian University. Retrieved from <http://www.jisc.ac.uk/media/documents/projects/llidareportjune2009.pdf>
- Bereiter, C. (1997). Situated cognition and how to overcome it. In D. Kirshner, & J. A. Whitson (Eds.), *Situated cognition: Social, semiotic, and psychological perspectives* (pp. 281-300). Hillsdale, NJ: Erlbaum.
- Bereiter, C., & Scardamalia, M. (1993). *Surpassing ourselves: An inquiry into the nature and implications of expertise*. Chicago: Open Court.
- Biesta, G. J. J., Field, J., Hodkinson, Ph., Macleod, F. J., & Goodson, I. F. (2011). *Improving learning through the lifecourse. Learning lives*. New York and London: Routledge.
- Castañeda, L., & Adell, J. (Eds.). (2013). *Entornos Personales de Aprendizaje: claves para el ecosistema educativo en red*. Alcoy: Marfil. Retrieved from <http://digitum.um.es/xmlui/bitstream/10201/30427/1/CastanedayAdellibroPLE.pdf>
- Clifford, M.M. (1991). Risk Taking: Theoretical, Empirical, and Educational Considerations. *Educational Psychologist*, 26, 263-297. doi: <http://dx.doi.org/10.1080/00461520.1991.9653135>
- Coll, C. (2013). La educación formal en la nueva ecología del aprendizaje: tendencias, retos y agenda de investigación. In J. L. Rodríguez Illera (Eds.), *Aprendizaje y Educación en la Sociedad Digital* (pp. 156-170). Barcelona: Universitat de Barcelona. Retrieved from <http://www.psyed.edu.es/archivos/grintie/AprendizajeEducacionSociedadDigital.pdf>
- Coll, C., & Falsafi, L. (2010). Learner identity. An educational and analytical tool. *Revista de Educación*, 353, 211-233. Retrieved from http://www.revistaeducacion.educacion.es/re353/re353_08esp.pdf
- Collins, A., & Halverson, R. (2010). *Rethinking education in the age of technology. The digital revolution and schooling in America*. New York: Teachers College.
- Crook, C. (1996). *Computers and the collaborative experience of learning*. New York: Routledge.
- Csikszentmihalyi, M. (1990). *Creativity: Flow and the psychology of discovery and invention*. New York: Harper Collins.
- Dabbagh, N., & Kitsantas, A. (2012). Personal Learning Environments, social media, and self-regulated learning: A natural formula for connecting formal and informal learning. *The Internet and Higher Education*, 15(1), 3-8. doi: <http://dx.doi.org/10.1016/j.iheduc.2011.06.002>
- Dewett, T. (2007). Linking intrinsic motivation, risk taking, and employee creativity in an R&D environment. *R&D Management*, 37(3), 197-208. doi: <http://dx.doi.org/10.1111/j.1467-9310.2007.00469.x>
- Dillenbourg, P. (2000). Virtual learning environments. Workshop on virtual learning environments. Retrieved from <http://tecfa.unige.ch/tecfa/publicat/dil-papers-2/Dil.7.5.18.pdf>

- Dirkin, K. H., & Mishra, P. (2010). Values, beliefs, and perspectives: Teaching online within the zone of possibility created by technology. In D. Gibson, & B. Dodge (Eds.), *Proceedings of the Society for Information Technology & Teacher Education International Conference 2010* (pp. 3811–3817). Chesapeake, VA: AACE. Retrieved from <http://editlib.org/p/33974>
- Erstad, O., & Sefton-Green, J. (2013). (Eds.). *Identity, community and learning lives in the digital age*. Cambridge: Cambridge University Press.
- Falsafi, L. (2011). Learner identity. A sociocultural approach to how people recognize and construct themselves as learners. Doctoral thesis. Universidad de Barcelona. Retrieved from http://www.psyed.edu.es/prodGrintie/tesis/Falsafi_Thesis.pdf
- Gee, J. 2003. *What video games have to teach us about learning and literacy*. New York: Palgrave MacMillan.
- Giroux, H.A., & Schmidt, M. (2004). Closing the achievement gap: A metaphor for children left behind. *Journal of Educational Change*, 5, 213-228. doi: <http://dx.doi.org/10.1023/B:JEDU.0000041041.71525.67>
- Harasim, L. et al. (2000). *Redes de aprendizaje. Guía para la enseñanza y el aprendizaje en red*. Barcelona: Gedisa.
- Harasim, L., Hiltz, S.R., Teles, L. and Turoff, M. (2000). *Learning Networks: A Field Guide to Teaching & Learning Online*. Cambridge: MIT Press.
- Ito, M., Gutierrez, K., Livingstone, S., Penuel, B., Rhodes, J., Salen, K., Schor, J., Sefton-Green, J., & Watkins, C. (2013) *Connected Learning: An Agenda for Research and Design*. Irvine, CA: Digital Media and Learning Research Hub.
- JISC. (2012). Learning in a digital age. Retrieved from <http://www.jisc.ac.uk/whatwedo/programmes/elearning/digilifelong.aspx>
- Kereluik, K., Mishra, P., Hagerman, M., DeSchryver, M., Wolf, L., Fisser, P., Shin, T., Terry, L., & Koehler, M. (2012). What would John Dewey Do: Programmatic design for developing TPACK for 21st Century Learning. In P. Resta (Ed.), *Proceedings of Society for Information Technology & Teacher Education International Conference 2012* (pp. 4724-4728). Chesapeake, VA: AACE.
- Kereluik, K., Mishra, P., Fahnoe, C., & Terry, L. (2013). What knowledge is of most worth: Teacher knowledge for 21st century learning. *Journal of Digital Learning in Teacher Education*, 29(4), 127-140. doi: <http://dx.doi.org/10.1080/21532974.2013.10784716>
- Knobel, M., & Lankshear, C. (2008). Remix: The art and craft of endless hybridization. *Journal of Adolescent & Adult Literacy*. 52(1), 22-33. doi: <http://dx.doi.org/10.1598/JAAL.52.1.3>
- Lave, J., & Wenger, E. (1991). *Situated learning: Legitimate peripheral participation*. Cambridge: Cambridge University Press. doi: <http://dx.doi.org/10.1017/CBO9780511815355>
- Leander, K. M., Phillips, N. C., & Taylor, K. H. (2010). The changing social spaces of learning: Mapping new mobilities. *Review of Research in Education*, 34, 329-394. doi: <http://dx.doi.org/10.3102/0091732X09358129>
- Mahiri, J. (2011). *Digital tools in urban schools: Mediating a remix of learning*. Ann Arbor: University of Michigan Press. doi: <http://dx.doi.org/10.3998/toi.10329379.0001.001>
- Mishra, P., Henriksen, D., & The Deep-Play Research Group. (2012). On Being (In)disciplined. *Tech Trends* 56(6), 18-21. doi: <http://dx.doi.org/10.1007/s11528-012-0608-y>
- Mishra, P., Koehler, M. J., & Henriksen, D. (2011). The Seven Trans-disciplinary Habits of Mind: Extending the TPACK Framework Towards 21st Century Learning. *Educational Technology*, 11(2), 22-28.
- Nonaka, I., & Takeuchi H. (1995). *The knowledge creating company; How Japanese companies create the dynamics of innovation*. New York: Oxford University Press.

- Paavola, S., & Hakkarainen, K. (2005). The knowledge creation metaphor – an emergent epistemological approach to learning. *Science & Education*, 14, 535-557. doi: <http://dx.doi.org/10.1007/s11191-004-5157-0>
- Paavola, S., & Hakkarainen, K. (2009). From meaning making to joint construction of knowledge practices and artefacts – A trialogical approach to CSCL. Retrieved from <http://www.helsinki.fi/science/networkedlearning/texts/paavola-hakkarainen-2009-trialogical-cscl.pdf>
- Rogoff, B. (1993). *Aprendices del pensamiento. El desarrollo cognitivo en el contexto social*. Barcelona: Paidós.
- Root-Bernstein, R. S. (2003). The art of innovation: Polymaths and the universality of the creative process. In L. Shavanina (Ed.), *International handbook of innovation* (pp. 267-278). Amsterdam: Elsevier. doi: <http://dx.doi.org/10.1016/B978-008044198-6/50018-8>
- Root-Bernstein, R. S., & Root-Bernstein, M. M. (1999). *Sparks of genius: The thirteen thinking tools of the world's most creative people*. Houghton Mifflin Harcourt.
- Snowden, D. J., & Boone, M. E. (2007). A leader's framework for decision making. *Harvard Business Review*, 85(11), 68. Retrieved from <http://aacu-secure.nisgroup.com/meetings/ild/documents/Symonette.MakeAssessmentWork.ALeadersFramework.pdf>
- Vygotsky, L. (1978). *Mind in society: The development of higher psychological processes*. Cambridge, MA: Harvard University Press.
- Wenger, E. (2001). *Comunidades de práctica. Aprendizaje, significado e identidad*. Barcelona: Paidós.
- Williams, R., Karousou, R., & Mackness, J. (2011). Emergent learning and learning ecologies in web 2.0. *The International Review of Research in Open and Distance Learning*, 12(3), 39-59. Retrieved from <http://www.irrodl.org/index.php/irrodl/article/view/88>

About the authors

Janaina Minelli de Oliveira

janaina.oliveira@urv.cat

ORCID ID: <http://orcid.org/0000-0001-5946-3622>

Associate Professor at Rovira i Virgili University (URV), Spain

Janaina Minelli de Oliveira is a Doctor in Applied Linguistics and an Associate Professor at the Rovira i Virgili University. She is a member of the Applied Research Group in Educational Technology (ARGET) and leads the Creative Learning with ICT (CLict) group of teaching innovation. She develops her research and teaching at the intersection of education, technology and social semiotics. (<http://learningasrepresentation.wordpress.com>).

Universitat Rovira i Virgili
Departament de Pedagogia - FCEP
Campus Sescelades
Carretera de Valls, s/n
43007 Tarragona
Spain

Danah Henriksen

henrikse@msu.edu

ORCID ID: <http://orcid.org/0000-0001-5109-6960>

Visiting Assistant Professor at Michigan State University (MSU), USA

Dr. Danah Henriksen is a Visiting Assistant Professor of Educational Technology at the Michigan State University College of Education. Her research has examined creativity among exceptional teachers through the in-depth qualitative study of the creative thought processes and teaching practices of National Teacher of the Year award winners and finalists. Her current work and research interests focus on several strands of research related to creativity and technology, such as evaluation schemas for creative work in technology-rich settings, trans-disciplinary thinking, and creative-cognitive skills for teaching and learning. She is a co-leader/manager of the Deep-Play Research Group at the MSU College of Education, which focuses on research related to creativity, technology, and 21st century issues of teaching and learning. Numerous aspects of her work and research have been presented at conferences such as AERA and SITE and her work has been published in peer-reviewed educational journals such as *Educational Technology* and *Tech Trends* as well as at practitioner venues such as Educational Leadership. She has taught a variety of courses in the area of educational psychology and learning technology, focusing on issues of design and creativity, technology for teaching, and the psychology of learning in technology-rich contexts.

620 Farm Lane, Rm 442

East Lansing

MI 48824

USA

Linda Castañeda

lindacq@um.es

ORCID ID: <http://orcid.org/0000-0002-1055-9241>

Senior Lecturer at University of Murcia (UM), Spain

Dr. Linda Castañeda is Senior Lecturer in Educational Technology in the Department of Didactics and School Organization at the University of Murcia (Spain). She is also a member of GITE (Educational Technology Research Group). She is an Educationalist from the University of Murcia and holds a PhD in Educational Technology from the University of the Balearic Islands (Extraordinary Doctorate Award and European Mention). She has spent several periods on research visits to the Knowledge Media Institute of the Open University in the UK, the Research Group on E-learning at the University of Oxford, and the Centre for Education and New Technologies (CENT) at the Jaume I University in Castellon (Spain). With her background in Educational Technology, she has participated in national and international research projects centered on the use, integration and evaluation of Information and Communication Technologies in Education, e-learning, and the impact of these technologies on social, curricular and organizational change. Her current research is centered on Web 2.0 in education and training, Personal Learning Environments and Emergent Technologies and Pedagogies. Dr. Castañeda has participated in a wide range of international events as speaker and has published numerous books and papers in specialized journals and conferences.

Universidad de Murcia

Facultad de Educación

Campus Universitario de Espinardo

30100 Murcia

Spain

Marta Marimon

marta.marimon@uvic.cat

ORCID ID: <http://orcid.org/0000-0002-1070-0495>

Tenured professor at the University of Vic (UVic), Spain

Dr. Marta Marimon holds a PhD in Pedagogy, Teacher Training and Psychopedagogy. She is a tenured professor in the School of Education, Translation and Human Sciences at the University of Vic, where she teaches Educational Technology on the Bachelor's degrees in Teacher Training and Social Education and on the Master's degree in Innovation in Specific Didactics. She is a member of the EMA (Environments and Materials for Learning) consolidated research group, and collaborates with the GRAC (Learning and Communication) research group on teaching and learning with digital aids. She is a member of the GITIC (Incorporation of ICTs into University Education) research group on innovation in education and the coordinator of the CIFE (Center for Innovation and Educational Training) training group on methodologies in the digital classroom at the University of Vic. She has participated in numerous nationally funded public research projects on the use of ICTs in education. She has participated in numerous national and international conferences and has published various articles and book chapters on the subject. She is currently participating in a research project on university co-design strategies based on the intensive use of ICTs and in a teaching innovation project aimed at energizing the role of university students via their personal learning environments.

Universitat de Vic

Facultat d'Educació, Traducció i Ciències Humanes

Sagrada Família, 7

08500 Vic

Spain

Elena Barberà

ebarbera@uoc.edu

ORCID ID: <http://orcid.org/0000-0002-9315-8231>

Director of the PhD Program "Education and ICT" at the Open University of Catalonia (UOC), Spain

Elena Barberà holds a PhD in Educational Psychology and is a senior researcher at the eLearn Center of the Open University of Catalonia (UOC) in Barcelona. She is currently the Director of Research for the eLearn Center. She is also a director of the doctorate program in Education and ICT at the UOC and an adjunct professor for the international doctorate in Nova Southeastern University in Florida (USA). Her research activity specializes in the area of educational psychology, with particular interest in web-based knowledge-construction processes, interaction in e-learning environments, assessment and quality, and the time factor in distance learning using ICT. As head of the EDUS (Distance School and University Education) research group, she currently participates in national and international projects. She is an external evaluator of national and European research projects (e-learning and Lifelong Learning calls) and impact journals (Computers and Education, Educational Technology & Society). She trains university teachers around the world and has published over a hundred papers and fifteen books in the field of education with ICT.

Universitat Oberta de Catalunya (UOC)

Av. Canal Olímpic, s/n. Edifici B3

Parc Mediterrani de la Tecnologia

08860 Castelldefels (Barcelona)

Spain

Carles Monereo

carles.monereo@uab.es

ORCID ID: <http://orcid.org/0000-0001-7447-985X>

University Lecturer at the Autonomous University of Barcelona (UAB), Spain

In 1985 he was awarded his PhD in Psychology from the Autonomous University of Barcelona (Spain). In 1988 he became a university lecturer and in 1999 he became the general coordinator of the *Seminario interuniversitario de investigación en estrategias de enseñanza-aprendizaje* (SINTE), a research team recognized by the Catalan government (<http://www.sinte.es/>). In 2003 he became co-editor-in-chief of the SSCI-indexed journal "Infancia & Aprendizaje" (<http://www.tandfonline.com/loi/riyazo#.VHYnmDGG8oE>). In 2004 he became an advisor for Graó Edicions and a co-director of the collection "Crítica y fundamentos". In 2005 he was made coordinator of the Interuniversity PhD program in Educational Psychology (DIPE) at the Autonomous University of Barcelona (<http://www.psyed.edu.es/mipe-dipe/>) and in 2011 he was awarded accreditation as a university professor. His research fields include teacher identity and teacher training, teaching and learning strategies, competences assessment, and the educational use of ICT.

Universitat Autònoma de Barcelona
Facultat de Psicologia
Departament de Psicologia de l'Educació
08193 Bellaterra
Spain

César Coll

ccoll@ub.edu

ORCID ID: <http://orcid.org/0000-0001-7669-6268>

Professor of Educational Psychology at the University of Barcelona (UB), Spain

Dr. César Coll has promoted and directed research on the pedagogical implications of genetic psychology and epistemology, psychology counseling and intervention, the design and development of the school curriculum, interaction processes in educational contexts, and the analysis of educational practices. He has been the coordinator of the *Research Group on Interaction and Educational Influence* (<http://www.psyed.edu.es/grintie>) since its creation in the late 1980s. He has also carried out educational consulting in several countries, especially in curricular, educational and psychology topics. He is the author of numerous articles published in national and international academic and professional journals. Among the books he has written, directed or coordinated are *Psicología y Curriculum* (1987), *Desarrollo Psicológico y Educación* (co-editor, with J. Palacios and A. Marchesi, 1990; 2001, 2014), *El constructivismo en el aula* (collective work, 1993), *Curriculum i ciutadania* (director, 2007), *Psicología de la Educación Virtual* (co-editor, with C. Monereo, 2008) and *Desarrollo, aprendizaje y enseñanza en la Educación Secundaria* (editor, 2010).

Universitat de Barcelona
Departament de Psicologia Evolutiva i de l'Educació
Facultat de Psicologia
Campus de la Vall d'Hebron
Passeig de la Vall d'Hebron, 171
08035 Barcelona
Spain

Jabari Mahiri

jmahiri@berkeley.edu

ORCID ID: <http://orcid.org/0000-0002-3840-8330>

Professor of Education at the University of California (UC), Berkeley, USA

Jabari Mahiri is the inaugural holder of the William and Mary Jane Brinton Chair in Urban Teaching. He directs the TEACH Project (Technology, Equity, And Culture for High-performance schools). He is the Faculty Director of the Multicultural Urban Secondary English Program and the Bay Area Writing Project. He received UC Berkeley's first Chancellor's Award for Advancing Institutional Excellence as well as the Chancellor's Community Service Award. He is author of *Digital Tools in Urban Schools* (2011); *Out of Bounds: When Scholarship Athletes Become Academic Scholars* (2010) with Derek Van Rheenen; and *Shooting for Excellence: African American and Youth Culture in New Century Schools* (1998). He is editor of *What They Don't Learn in School: Literacy in the Lives of Urban Youth* (2004); *Urban Teachers Researching Their First Year of Practice* (2014); and, the forthcoming book, *Virtual Literacies of Global Youth*.

Graduate School of Education
University of California Berkeley
5615 Tolman Hall
Berkeley, CA 94720
USA

Punya Mishra

punya@msu.edu

ORCID ID: <http://orcid.org/0000-0002-9300-4996>

Professor at Michigan State University (MSU), USA

Dr. Punya Mishra is Professor of Educational Technology at Michigan State University, where he directs the Master of Arts program in Educational Technology. He is internationally recognized for his work on technology integration in teaching, teacher creativity and the design of computer-based learning environments. With Dr. M. J. Koehler, he developed the Technological Pedagogical Content Knowledge (TPACK) framework, which has been described as "the most significant advancement in the area of technology integration in the past 25 years." He has been recognized as one of the most influential people in educational technology by the journal *Technology and Learning*. You can find out more about Dr. Mishra by visiting <http://punyamishra.com/>

Erickson Hall
620 Farm Lane, Room 509A
College of Education
Michigan State University
East Lansing MI 48824
USA



The texts published in this journal are – unless indicated otherwise – covered by the Creative Commons Spain Attribution 3.0 licence. You may copy, distribute, transmit and adapt the work, provided you attribute it (authorship, journal name, publisher) in the manner specified by the author(s) or licensor(s). The full text of the licence can be consulted here: <http://creativecommons.org/licenses/by/3.0/es/deed.en>

