

**journal**  
**de l'association**  
**comenius journal**  
**of the comenius**  
**association** № 28

— September - 2019



**DSE**

*and*

# DIGITAL TECHNOLOGIES AND VIRTUAL LEARNING ENVIRONMENTS - ACTIVE METHODOLOGIES TO PROMOTE DIGITAL EDUCATION



Ana Loureiro

Associate Professor  
Santarém Polytechnic Institute  
Santarém Higher School of Education  
Santarém - Portugal

## ABSTRACT

We live in a networked digital society, in an era of sharing and collaboration, made possible by the exponential growth of the World Wide Web, in particular Web 2.0 and Social Web. Digital technologies have been revolutionizing and (re-) shaping society. Education, as a key area of knowledge, cannot be oblivious to these changes, remaining stuck in old habits and methods of teaching and learning.

In order to be effective in today's digital society, citizens must have functional and critical thinking skills related to information, media and technology. For UNESCO, empowering citizens through information and media literacy is an important prerequisite for promoting equitable access to information and knowledge and building inclusive knowledge societies. This empowering can begin within the family, but also, and fundamentally, in a school context. Therefore, it is important that the School is able to respond to this challenge.

In this paper, we will discuss about the importance of collaborative learning and how digital technologies and virtual learning environments contribute towards a digital society.

## RÉSUMÉ

Nous vivons dans une société digitalement connectée, dans une époque de partage et collaboration. Ceci a été rendu possible grâce à la croissance exponentielle du World Wide Web, et en particulier du Web 2.0 et du Social Web. Les technologies digitales sont en train de révolutionner et de redéfinir notre société. L'éducation, un des domaines essentiels du savoir, ne peut demeurer insensible à ces changements, en restant attachée à ses vieilles habitudes et méthodes d'enseignement et d'apprentissage.

Pour être efficace dans la société digitale actuelle, les citoyens doivent maîtriser des compétences d'esprit critique en ce qui concerne l'information, les media et la technologie. Pour l'UNESCO, responsabiliser les citoyens à travers la maîtrise du numérique et l'initiation aux media est un prérequis essentiel pour promouvoir l'accès équitable à l'information et au savoir, et pour construire des sociétés du savoir inclusives. Cette responsabilisation peut commencer dans les familles, mais doit aussi se poursuivre, plus fondamentalement, dans le contexte scolaire. Il est donc primordial que l'Ecole soit capable de relever ce défi.

Dans cet article, nous développons l'importance de l'apprentissage collaboratif et comment les technologies digitales et les environnements virtuels d'apprentissage contribuent à cette société digitale.

Students of digital society or network society (Castells, 2005), often identified as digital natives (Prensky, 2001), millennial or generation Y, net generation (Tapscot, 2008) or generation 2.0 (Figueiredo, 2010), were born, grew up and live in the digital age. As stated by Figueiredo (2010), these students live with and in technology. They are individuals capable of easily and naturally performing various

tasks simultaneously (multitasking). With the digital society, and with particular relevance to the facilities offered by the World Wide Web (Web), we can witness another way of learning, based on research and lifelong learning (LLL).

LLL is the pursuit of permanent and continuous knowledge, voluntary and self-motivated, for both personal and

professional reasons, improving social inclusion, active citizenship and personal development as well as competitiveness and employability. Learning is not confined to the classroom, but rather takes place in the varied experiences and in a variety of situations experienced throughout life and continuously. Today's Web is more than just a means of searching for information and social contact, it is also a learning tool that enables other ways to build and share knowledge. For this reason, teachers need to develop other teaching strategies to meet the learning needs of digital age students by developing and enhancing their skills.

These skills are related with:

- digital literacy;
- communication skills (reading, writing, speaking, listening);
- learn independently;
- soft skills (ethics, positive attitude, responsibility);
- work in teams;
- adapt to new circumstances;
- reasoning skills (problem solving and critical, logical and numerical reasoning);
- information literacy (knowing where to go for information and how to process it).

Thus, these changes include the use of digital technologies in learning contexts, namely through the use of online tools and virtual environments, and the change to a game-based learning pedagogy, among others. These areas, as well as the Social Web and Collective Intelligence, have been identified by NMC Horizon Report Higher Education Edition as emerging and of enormous educational potential.

According to Figueiredo (2010), for students of digital society there does not seem to be a distinction between virtual and real. The "virtual" of a computer game that allows them to interact with characters and manipulate multiple objects is much more real to them than the "real" of a story they read in a book. They learn easily in a segmented way, relegating to later the final synthesis, which they build without haste and intuitively. They have much less need

for knowledge to be provided in an orderly and structured manner. But not all students belong to this layer of society, here referred to as generation 2.0. In parallel, we also find digital immigrants (Prensky, 2001), generation X or generation 1.0 (Figueiredo, 2010), who were not born with digital technologies. Technologies were emerging and there was a need for adaptation, learning, absorbing different knowledge.

Today learning contexts go beyond the physical space of the so-called traditional classroom, students have the opportunity to be in constant learning, for example using digital technologies and online virtual environments, enabling real-time collaboration, whether by voice, video, image or text (Rabinovich and Horwitz, 2006). In online environments, the ability to socialize is assumed to be of greater importance, considering it as a key factor for collaborative learning and knowledge building. We understand, in a broad way, that we are facing a collaborative learning situation when one or more people learn or try to learn something together. Thus, a virtual learning environment (VLE) has specific characteristics such as the fact that they are spaces of information and socialization and where students are not only active but also actors. They are not restricted to distance education and integrate multiple tools, complement the physical space of the classroom and are explicitly represented (Dillenbourg, 1999). A VLE is "a set of teaching and learning tools designed to enhance a student's learning experience by including computers and the Internet in the learning process". The use of digital technologies as a way of valuing learning contexts is an added advantage, especially because students seem to have a lot of practice in using them. Students attending higher education after 2000 have been found to need a more active learning environment based on innovative teaching strategies. However, what they often find are strategies out of touch with current reality and their actual needs. Thus, they are asked to sit in lines and attend lectures and collect notes or solve exercises assigned by the teacher; It is a teaching strategy that does not prepare them to be critical citizens or empower them to be autonomous in building their own knowledge. (Bettencourt, 2009). These students are comfortable with just-in-time learning: learning what is needed when and only when it is needed. (Figueiredo,

2010). They live in a multimodal and interconnected society, and for them this way of dealing with information is much more intense and appealing than listening to a single source of information at a time (Veen and Vrakking, 2006).

Much of our daily activity takes place in a digital environment, using online tools and social networks. Social networks of professional, academic or more social or playful nature can be found and are used by almost everyone, regardless of gender, age or social status. As noted by Castells (2005), a network-based social structure is a highly dynamic, open system that is open to innovation and free from threats to its balance. With social networks we can establish a set of connections and relationships based on interests, likes or needs, allowing you to communicate, share, interact and collaborate quickly and from anywhere, as long as we have access to the Internet. In education social networks, web tools, virtual environments and digital technologies have been gradually introduced. As mentioned above, most of our students are from generation 2.0 and as such feel comfortable using these technologies and environments. It is up to teachers to help students use these tools and environments more effectively and optimally. In this way, they reveal to students other ways of use, in order to share information and acquire knowledge through access to a varied and credible set of information and content and experts. This gives students tools that enable them to search, select, share and reuse information. The teacher assumes the role of facilitator, guide and advisor, leaving the student a more active role in seeking information and building their knowledge. These competences are of prime importance, especially because today's society "requires that learners can apply, analyze, synthesize and evaluate information" (Chapman, Ramondt, and Smiley, 2005) when in the workplace.

Initially, higher education institutions (HEI) began using online learning management systems (LMS) and learning content management (LCM) to enable teachers to share documents to support their classes.

Platforms such as Moodle, for example, are now part of the daily life of HEIs, and allow some interaction between teachers and students. However, in this type of LMS, the

student can only share information if the teacher gives him the possibility. This is not always the case, so in most cases students use Moodle to look up documents provided by the teacher or to deliver assignments as if it were a repository of information.

More recently, social networks, web tools and collaborative virtual environments have been integrated into learning contexts, bringing changes such that we no longer imagine ourselves teaching without them. Hargadon (2009) points out three aspects that he considers to define educational social online environments:

- the ability to collaborate with others both synchronously and asynchronously;
- the ability to create a personal profile built solely around educational and curriculum specialties and interests, making it easier to find other people, resources, events and discussions around the same interests;
- the ability to more easily find, organize, manage and share information and content.

We understand that socialization is a key factor for collaborative learning and knowledge building. Thus, and like Palloff and Pratt (2005), we consider that the main benefits of collaborative learning are the development of critical thinking capacity, co-creation of knowledge and meaning, reflection and transformative learning. However, the social component, often referred to as important for gaining new skills and learning, is not a key factor in LMS platforms such as Moodle, which focuses more on content distribution and management. Socialization is the essence of social networking and is a success factor for the social web.

As we mentioned earlier, these social networks are widely used by students, although not always with a learning perspective.

In fact, digital technologies and online virtual environments bring various learning benefits to students, which can be summarized in five strands (Kreijns, Kirschner and Jochems, 2003; McLoughlin and Lee, 2007):

- Participatory learning, by encouraging participation in content creation and editing;

- Collaborative learning, provided by collaborative knowledge building, where the information shared by each individual can be recombined to create new forms, concepts, ideas, mash-ups and services;

- Autonomous learning, with the aim of sharing, communicating and discovering information in learning communities;

- Ability to communicate and interact, generating richer opportunities through socialization and community integration of learning;

- Lifelong learning by developing digital skills and joining the wisdom of the crowds.

Digital technologies and virtual learning environments enable students to shift from being mere passive recipients of information and knowledge to being active and reactive - seeking, creating, sharing and commenting on content and contexts, contributing to mass collaboration (Tapscott and Williams, 2008) or collective intelligence (Lévy, 1997) and for a wisdom of crowds (Surowiecki, 2005). Mass collaboration is based on transparency and trust among peers, where everyone contributes to the same end. There is a sharing of information and content that can and should be commented on and improved by the group, contributing to the whole. Bradley and McDonald (2011) described the cycle of mass collaboration in which a large and diverse group of individuals engages and contributes positively to a common purpose. Reinforcing the idea that the whole is better than the parts, comes the concept of wisdom of crowds that argues that "If you put together a big enough and diverse enough group of people and ask them to 'make decisions affecting matters of general interest', that group's decision will, over time, be 'intellectually superior to the isolated individual', no matter how smart or how well-informed he is" (Surowiecki, 2005).

The use of collaborative virtual learning environments offers students and teachers the essential means to coordinate their interactions in the same virtual universe of knowledge, because intelligence is distributed everywhere, implying the valorization of skills of this collaborative group. Online digital platforms allow not only to store and retrieve information

easily, but also to be shared with equal simplicity, promote interaction and the distribution of knowledge among users.

Despite students' clear interest in digital technologies, student participation in virtual learning environments cannot be taken for granted, there is a need to promote and maintain this participation. Students have to be stimulated and reminded about their roles and should be autonomous, but the teacher has to provide incentives. Interaction should be improved through two-way communication between participants, organizing social interaction, collaboration and shared activities, otherwise they are unlikely to occur or be meaningful. In a digital environment, the teacher also has to promote a sense of community and encourage the development of a social presence.

It is very important not to replicate so-called traditional classrooms in digital learning environments, it will make no sense if the only thing to change is the location or space. Methodologies that favor collaborative and network communication and interaction should be employed. Focusing more on students and their needs than on technology is crucial.

Implementing virtual learning environments with synchronous and asynchronous communication and interaction can be a solution to consider in various circumstances, whether or not associated with traditional classroom teaching. The virtual learning environments allows expanding the capacity of educational institutions, reaching new audiences. The combination and adaptation of different active methodologies contributes to the renewal of teaching methods and practices, making them more suited to the technological evolution of the digital society.

Digital technologies have brought about changes in the way students learn, not only in students in generation 2.0, but also in students in generation 1.0. Education thus needs a change, to be more personalized, more reflective, to be networked and to be digital.

ANA LOUREIRO

## References

- Bettencourt, T. (2009). Teaching & Learning in SL: Figuring Out Some Variables.  
Retrieved from: <http://cleobekkers.wordpress.com/2009/01/28/teaching-learning-in-sl-figuring-out-somevariables/>
- Bradley, A. e McDonald, M. (2011). The Social Organization: How to Use Social Media to Tap the Collective Genius of Your Customers and Employees. Harvard Business Review Press.
- Castells, M. (2005). A Sociedade em Rede. Fundação Calouste Gulbenkian.
- Chapman, C., Ramondt, L., e Smiley, G. (2005). Strong community, deep learning: Exploring the link. *Innovations in Education and Teaching International*, 47(3), 217-230.
- Dillenbourg P. (1999). What do you mean by collaborative learning? In P. Dillenbourg (Ed.), *Collaborative-learning: Cognitive and Computational Approaches* (pp.1-19). Oxford: Elsevier.
- Figueiredo, A. D. (2010) A Geração 2.0 e os Novos Saberes, Seminário 'Papel dos Media' das Jornadas "Cá Fora Também se Aprende", Conselho Nacional de Educação.  
Retrieved from: [http://www.academia.edu/237337/A\\_Geracao\\_2.0\\_e\\_os\\_Novos\\_Saberes](http://www.academia.edu/237337/A_Geracao_2.0_e_os_Novos_Saberes).
- Hargadon, S. (2009). Educational Networking: The Important Role Web 2.0 Will Play in Education.  
Retrieved from: <http://audio.edtechlive.com/lc/EducationalSocialNetworkingWhitepaper.pdf>
- Kreijns, K., Kirschner, P. e Jochems, W. (2003). Identifying the pitfalls for social interaction in computer-supported collaborative learning environments: A review of the research. *Computers in Human Behavior*, 19(3), 335-353.
- Lévy, P. (1997). Collective intelligence. Mankind's emerging world in cyberspace. Massachusetts: Perseus Books.
- McLoughlin, C. e Lee, M. (2007). Social software and participatory learning: Pedagogical choices with technology affordances in the Web 2.0 era. ICT: Providing choices for learners and learning. Proceedings ascilite Singapore 2007.  
Retrieved from: <http://www.ascilite.org.au/conferences/singapore07/procs/mcloughlin.pdf>
- Palloff, R. M., e Pratt, K. (2005). Collaborating online: Learning together in community. San Francisco, CA: Jossey-Bass.
- Prensky, M. (2001). Digital Natives, Digital Immigrants.  
Retrieved from: <http://www.marcprensky.com/writing/Prensky%20-%20Digital%20Natives,%20Digital%20Immigrants%20-%20Part1.pdf>
- Rabinovich, T. e Horwitz, R. (2006). The Extended Classroom: Providing on-campus and offcampus students with a comparable and rich learning experience. In T. Reeves & S. Yamashita (Eds.), *Proceedings of World Conference on E-Learning in Corporate, Government, Healthcare, and Higher Education 2006* (p. 856). Chesapeake, VA: AACE.  
Retrieved from: <http://www.editlib.org/p/23803>
- Surowiecki, J. (2005). The Wisdom of Crowds. Anchor Books.
- Tapscott, D. (2008) Grown Up Digital: How the Net Generation is Changing Your World. McGraw-Hill.
- Tapscott, D., & Williams, A. (2008). Wikinomics: How Mass Collaboration Changes Everything. USA: Penguin Group.
- Veen, W., e Vrakking, B. (2006). Homo Zappiens – Growing up in a digital age. London: Network Continuum Education.