

# An Enactivist Approach to Web-based Learning: Live Campus as a Proposal for a Learning Environment

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## ABSTRACT

*In the Web-based learning era, the possibility to use the online network for learning activities, studies and research has brought about a revolution in the educational processes and the emergence of a new culture characterized by the idea that knowledge is not closed and defined, but open and accessible to all. Within a perspective in which knowledge is generated by the interaction of the individual with the environment, the socio-constructivist approach paved the way to new theoretical frameworks that, starting from the social dimension of learning, acknowledge and embrace the biological aspects of learning processes, thus offering interesting reflections on the web-learning phenomenon. Stemming from these assumptions, LiveCampus was created; a social learning environment aimed at fostering a synergistic integration between the dimensions of formal and informal knowledge.*

*Keywords: Enactivism, Learning Environment, Socio-Constructivism, Web-based Learning*

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## INTRODUCTION

The latest Censis/UCSI report on communication entitled “The media is us. The beginning of the biomediatized era”<sup>1</sup> (2012) provides the findings related to media consumption, measured over a decade of evolution and analysis of the transformations occurred in the media ‘diets’ of the Italians.

As highlighted in the introduction to the report, the main results of this study show that the remarkable development of the Internet, due to both the expansion of the geographic coverage with the resulting increase of connected users, and the proliferation of applications (social tools, cloud computing<sup>2</sup>) of web 2.0, social networks as well as the miniaturization of hardware de-

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vices and the proliferation of mobile connections have emphasized the primacy of the individual (Censis/UCSI, 2012).

The same document stressed that the individual is reflected in the media in the content created by the individual himself, who is also the producer. It is us who build our personal media schedules, tailored according to our needs and preferences, continually create digital contents, thanks to the Internet, which makes it available in a variety of ways. The self-production of content on the web favors mostly the enactment of the self: the user is the content. The spread of the app for smartphones and cloud computing reinforce the *focus* on the individual in the media system. Machines are becoming smaller and all the more portable, practically becoming an appendage of the body: an extension that adds to its functions, it enhances the capabilities, facilitates expression and relationships, thus leading to a new phase. It is the biomedicine era in which the virtual transcription and the sharing of electronic personal biographies become central<sup>3</sup>.

Every day millions of posts are published; it is estimated that there are over 145 million networks of blogs, over 200 million tweets are written, 1152 hours of video uploaded on YouTube and 4.5 million photos on Flickr are published. Overwhelmed by this flow of information, we spend our days working through the screens of posts to read, emails to open and newsletters to view. Our friends and people that we follow on the various social networks submerge us with updates on their lives and various links: potentially each of these opens another set of links to explore, and urges us to join in another newsletter, another blog, another Facebook page, which are new flows of information to be processed every day.

Faced with this situation, many react by multiplying their efforts to keep up with everything, or, conversely, closing their shutters and retreating into a voluntary ignorance: both behaviors, if on the one hand are humanly understandable, on the other hand lead to risks or side effects<sup>4</sup>.

In the wake of the new tools offered by Web 2.0, with the enhancement of the network as a field of the development of social networking, it is possible to imagine new media consumption scenarios that favor the dialectic relationship, sometimes antithetical<sup>5</sup>, between formal / informal, artificial / natural, platform / network / study work, personal / social, size.

To use the contemporary resources with full awareness and address the complexity of society, it is no longer enough to be skilled in literacy and numeracy, but acquire critical and creative thinking skills to filter and understand media messages<sup>6</sup>.

## **WEB-BASED LEARNING: FROM THE SOCIO-CONSTRUCTIVIST TO THE ENACTIVIST APPROACH**

In the web-based learning era, the possibility to use the network for learning activities, studies and research enabled the learner to be the protagonist of his/her own cultural growth in the so-called Web 2.0, which is now considered a social context in which everyone can express themselves through different languages and can access information and communicate across time and space boundaries. This has brought about a revolution in the educational processes and the emergence of a new culture characterized by the idea that knowledge is not closed and defined, but open and accessible to all, within the perspective of a shared and participated knowledge (Falcinelli, 2012).

This scenario has consequently required a rethinking of the teaching-learning process with the aim of a knowledge construction that can be socially shared, participated and reticular and in which the learner can be the protagonist and co-creator of knowledge processes.

Since Web learning represents a participatory and collaborative learning approach, allowing learners' connection and social interaction, it is necessary to reflect on the potential of social networking in order to reduce the gap between the traditional "formalized interactions" that oc-

cur in educational institutions and the ways of learning, socialization and communication that new generations, the so-called “digital natives”, can experience through the Internet and ICT (McLoughlin & Lee, 2010).

In this sense, interesting reflections derive from the studies on social learning, according to which interaction plays a key role in students’ learning processes within Web-based contexts. In fact, the basic assumption is that knowledge is not an individual process, as it is built when individuals are involved in activities, receive feedback, and participate in other forms of human interaction within social contexts (Henning, 2004). Thus, learning would be realized starting from the interactions that a student has with others and the context in which these interactions occur (Garrison & Cleveland, 2005). Similarly, human interactions within Web-Based learning environments would foster social learning processes associated with those interactions (McLoughlin & Lee, 2010). In the wake of these reflections, social learning theories identify learning communities as the most effective way of acquiring and sharing knowledge. Indeed, the basic assumption is that people learn by observing and imitating other people. In particular, the socio-constructivist approach assigns to learning a dimension of individual responsibility that is expressed in belonging to the community (Grimshaw et al., 2009). In this sense, communities provide a safe learning environment that promotes learning processes through observation, interaction and sharing of a subject with others. Thus, the model of collaborative learning, which characterizes the present educational and formative processes in the net, allows individual growth within the learning goals shared by a group. In this perspective, individual learning is the result of a collective process. In virtual learning communities of individual participants give continuity to the formative event by sharing areas of interest and communicating interactively. The single user becomes a producer of information, which in turn becomes shared knowledge, disconnected from the source and independent from the subject who produced it. The communication flow overcomes the learning object, breaking it down and reassembling it into a new object, which is the result of the collective elaboration made possible by the Web (Ludovisi, 2008).

Within a perspective in which knowledge is generated by the interaction of the subject with the environment, the socio-constructivist approach paved the way to new theoretical frameworks that, starting from the social dimension of learning, acknowledge and embrace the biological aspects of learning processes, thus offering interesting reflections on the web learning phenomenon.

In particular, the enactivist approach (Varela, Thompson & Rosch, 1991), which is rooted in two main theoretical paradigms, namely the Merleau-Ponty phenomenological work and Bateson’s biological perspective, considers cognition as a complex co-evolutionary process of interacting systems that influence one another (Davis, Sumara, & Luce-Kapler, 2000). In this sense, the cognitive process is conceived as a human, social and biological phenomenon producing meaning.

In enactivism, there is no separation. Living systems interact with their surrounding environment, they en-act reality receiving and elaborating its stimuli (Rossi, 2011; Fuchs and De Jaegher, 2009; Proulx 2004). The knowing subject and reality create a unitary structure, which emerges, lives and changes through such interactions. This is the concept of structural coupling (Maturana and Varela, 1992), which is at the core of the enactivist reflection, where the subject and the environment interact within the action and are respectively reformed. Considering the subject immersed in reality leads to a different conception of knowledge, which is no longer considered as mere representation or construction, but as enaction of meaning from experience and actions in the world and on the world, in constant interaction with what is other than me (Prenna, 2014).

In this theoretical framework, the inseparability of mind, body and environment, as attested by recent research in the neuro-scientific field, offers interesting suggestions to the studies on web-based learning and on the design of virtual environments that support learning processes. In

particular, the research on this specific topic is exploring the possibility to merge biological and technological platforms, conceived as tools for collaboration and co-emergency (Diodge, 2007; Etkin, Pittenger, Polan, & Kandel, 2005), with the aim of using technology to amplify cognitive processes. In this sense, learners can create their own learning environments with the support of technologies that, through their co-emergency, give rise to learning (Winchester et al., 2010).

## **A PROPOSAL OF SOCIAL LEARNING ENVIRONMENT: LIVECAMPUS**

The modern Information and Communication Technologies (ICTs) play a fundamental role in the knowledge society. However, today most of the tools used to access and manage information highlight some critical issues that threaten to fade their huge potential benefits. This is particularly evident in the case of the Web, seen as a big universal container of information that every day is enhanced with new content and it is becoming an essential point of reference for social and economic life. The more time passes, the more information is made available on the internet. The web is expanding exponentially (some 5 to 6 billion of new Web pages, but the figure is in constant growth) so much so that a generalized crisis, significantly referred to as information overload<sup>7</sup>, is envisaged.

The research and management of information in the network is becoming necessary also at school, at work and in every social context. Unfortunately, the difficulties in the use of strategies and technologies for research and the unconscious use of inefficient cognitive approaches limit their effectiveness. The majority of users do not yet possess the skills necessary to master the tools for the retrieval of information, particularly in focusing on the subject of the search and in selecting the results.

Among the critical issues that emerge, we refer in particular to the tools for searching, accessing, and selecting information, essential processes for knowledge construction. Indeed, these tools present some fundamental limitations, the most important of which is related to the technical approach used for research, based on keywords, and to the 'depersonalized' way of interaction with users, so that all users, for example, are treated equally, without considering the specific needs that characterize each individual user.

It is in this new digital *Umwelt* that we are daily immersed, so the main problem of research in Internet is to be able to recover the greatest number of relevant documents among the existing ones as possible. The biggest risk is not to find little material, but to find an unmanageable mass of information where only a little part is relevant for the research.

Thus, to face this problem, it is necessary to make a leap in quality and innovation. One possible solution is represented by intelligent platforms characterized by the use of systems of conceptual analysis of texts that exceed the evident limitations of the approach based on keywords and adaptive personalization techniques that allow us to adapt the system's behavior to the personal needs, habits and preferences of each user.

The relational modalities expressed by social networks, the connection to the group, the sharing of daily life, the contact through comments, same or similar signs, seem to be indispensable in the network, as they can be considered a point of no return but the presence of these features doesn't assure the survival, which it can be possible only if a users' need, even latent, is satisfied and to identify a solid business model.

The Web 2.0 is already considered as a period in its final phase, which is making way for the Real Time Web<sup>8</sup>, which represents a new form of communication and online presence: you seek and spread information on the Internet as soon as they are produced.

With this phenomenon the central role of people in social networks emerges: friends we choose represent the first filtration system of the complexity and heterogeneity of online information; it is them who will select the most interesting and valuable content. New technologies from this point of view put us in contact with tangible human dimensions: often we find something interesting because it's interesting to people close to us.

Much has been written regarding the potential and the possibilities of technology that can be deployed to optimize the teaching-learning processes. Images of students who explore new worlds, of teachers who manage rich archives of digital contents, the decisions taken on a wide range of data have justified significant economic investments to equip computer technology in our schools. However, despite the economic commitments, we must emphasize that, very often, learning materials and contexts are irrelevant from a contextual point of view and learners are often forced to acquire knowledge and rules that have no meaning to the forms through which they are transmitted. On the contrary, the immersion in an environment that requires to solve problems or to manage meaningful and interesting situations can stimulate learning and make it useful.

An accurate design and development of the educational environment is crucial to ensure that learners undertake a significant interaction for learning. This is a key component that interferes on the quality, nature and richness of interactions. Obviously, when we are in an online environment it is necessary to elaborate an adequate design of the Shared Information Space, that is the environment in which teaching-learning processes can be developed, going beyond the limits of time and space of an environment normally designated to didactic activities.

People learn in everyday life, talking, observing others, by trial and error. Today we are faced with three types of learning: self-directed learning, reflective learning and transformative learning<sup>9</sup>.

Starting from these assumptions and from the fact that technologies, their tools and online environments cannot be considered as the solution for all problems, but that it is necessary to know to learn consciously and in a meaningful way, LiveCampus was created, a social learning environment aimed at fostering a synergistic integration between the dimensions of formal and informal knowledge.

In this regard, LiveCampus moves on a double register, in which two different environments exist: a social environment (LCsocial) where users are the protagonists of the activities of construction and sharing of information and an environment dedicated to teaching (LCdidattica), in which teachers establish ways for learning.

As what concerns LiveCampus there is a greater involvement of students as it offers them opportunities to create and share contents and to interact with others. Students regularly use social network tools, which give significant possibilities to personalize and develop a strong sense of belonging to a community. These tools are integrated with teaching and offer students a virtual place for discussion, in which to express their ideas.

For example, LiveCampus combines the elements of an e-portfolio with weblogging and social networking tools in order to create what the authors refer to as Personal Learning Landscape, a personal horizon from which to look at the process of learning. Each user can build his/her own personal learning environment (PLE) by organizing the resources autonomously and by creating the necessary conditions for the realization of a learning environment.

Each student manages his/her own space in complete autonomy: he/she selects the friends to talk with, the group to which he/she would like to adhere and initiate community work aimed at specific targets. The success of environments like LiveCampus highlights a natural need for people to use the network to share their ideas, to reason and to get in touch with others.

Instead, the environment entitled LCdidattica is a learning management system, which defines a model of teaching and learning aimed at monitoring, managing and outlining each activity of the learner within the platform.

Such an environment dedicated to teaching envisages a two-pronged structure: that of the teacher and the one for the user. In the teacher mode, the teacher has the possibility to manage both the part related to users and groups and the one related to courses. For each single course the teacher can manage the contents by dividing the teaching activity focused on the delivery of information and the creation of resources such as audio-video recordings, lessons in web conference, etc., and in an interactive part focused on:

- Educational interventions in the form of demonstrations or additional explanations presented in FAQs, mailing lists or web forums;
- Brief interventions made by the students;
- E-tivity realized by the students, in the form of questionnaires or tests;
- Typical forms of formative assessment, with the use of questionnaires or formative assessment tests.

Instead, in the user mode the student has the possibility to access teaching materials, to feed the content repository, to connect to the provider to consult institutional information and at the same time become an open window on a wide range of social software and communication services.

In LiveCampus each student manages his/her own space in complete autonomy: he/she can select the friends to chat with, the group to adhere to and with whom to start a specifically-targeted community project. Beyond the specific functions, what characterizes this tool is the ambition to build a community of learners, engaged in the development, updating and correction of contents. It aims at offering an integrated service of support, information and sharing of resources and utilities.

LiveCampus has all the features and services required for social networking, like weblogging, file repositories, tagging, RSS feeds and much more. It is based on a web interface for the management of the community and the contents.

LiveCampus allows the user to have the total control over contents; every single object of the user's online profile is manageable with strict permissions that can make these contents accessible to individuals, groups, subgroups, to all or none at all<sup>10</sup>. This approach draws on the philosophy defined as "Smart" Social Network<sup>11</sup>. Furthermore, through a series of tools that allow the user to interact with external instruments typical of the Web as Social Networking, Personal file repository, weblogging, and RSS Feed, the user keeps connected to his/her digital *Umwelt*.

The intensive use of tagging and myLikes also allows users to enjoy the benefits of Folksonomy<sup>12</sup>, thus the research and the quality of the documents is simplified by the community of practice that also certifies the quality.

Web 2.0 environments offer students new opportunities to create and share contents and interact with others. The term "learning environment" is now widely used within the lexicon of educational sciences. Its spread has occurred simultaneously with the change of perspective registered in the field of educational psychology during the last two decades. We talk about the paradigm shift from teaching to learning: from a vision focused on teaching to a perspective focused on the learning subject and thus on his/her processes, with particular attention to how the context for supporting learning is constructed: how to facilitate, how to guide students in the construction of their knowledge and which situations are to be organized to foster learning.

The environment created by LiveCampus allows each subject to have a space where he/she can "write his/her story" and create his/her training pattern, made of links, resources on the Web, blog posts, or products (including multimedia) to "upload" in the appropriate section.

It's clear that, since this environment is not just a repository of information, but rather the result of a collective socioconstructivist and enactivist work that shares the cognitive path of

each participant in the activities, it's possible to consider it no more a simple fruition and sharing of information resources, but a construction and sharing of knowledge and cognitive processes.

The central core that supports this learning proposal is related to the satisfaction that younger generation express about communication technologies. It would not be a good choice to consider online learning processes marginalized in favor of the futile use that now dominates the network.

It will then be the methodological approach (pedagogical middleware) that will allow the dynamic and evolutionary construction of the Personal Learning Environment, where technologies will be conceived as tools supporting the objectives of knowledge construction in the space of network and relationships that it enables, which is always renegotiable and modifiable.

## **LIVECAMPUS: THE EXPERIENCE**

The prototype was tested over a period of three years at the University of Salerno, during the modules 'General and Special Didactics' and 'Technologies for Teaching and Learning', on a sample of 1530 students. The purpose of this study was to understand the accessibility, usability and usefulness of the environment, to investigate the dynamics of its use, the potential advantages and / or disadvantages and the possible repercussions on teaching practice, as well as the formal and informal dynamics created by the students.

Through the users' profiling in the platform, it was possible to make a qualitative and quantitative analysis about:

- The users who use the option "single sign in";
- Access frequency and time slots;
- Type of device used;
- Frequency of profile updating;
- Duration of connection in the social and educational environment.

A detailed analysis of these data revealed that:

- 70% of users used the option "single sign in", i.e. the use of login credentials for Facebook to access the platform LiveCampus, importing and sharing all or part of their profile.
- It was found that this activity was carried out by 20% of users after the enrollment;
- 60% of users connected to the network more than 3 hours per day, mainly between late morning and early afternoon, while the remaining 40% connect for a period of 1 to 3 hours per day;
- 74% of users connected from a mobile device and this is demonstrated by the time spent connected since they didn't log out;
- 98% of students created and updated a profile on LiveCampus but only 60% update their notice board at least once a week; 44% of students use LiveCampus to be updated on news and then as passive receptors while 20% use LiveCampus to download and store documents uploaded by teachers. This testifies the fact that users remain anchored to the logic of distribution, which gives the control to the teacher.

However, the most relevant element is that the percentage of permanence connection into the social environment is by far higher than that in the teaching environment. In fact, while in the latter the access is exclusively a result of teachers' suggestions and the proposals, the social environment is used for all the autonomous study activities.

## CONCLUSION

The facilitation of communication processes, the spread of new technologies and the proliferation of digital contents stimulate new relationship dynamics and new ways of construction of knowledge that change the rules of public and private life, triggering different types of participation and sharing of experiences and knowledge.

According to Manovich (2001) and Castells (1996) new technologies follow the cultural and economic dynamics of a globalized society in which every web citizen can build his/her own lifestyle and spread his/her own “ideology”.

The development of technologies has created a new way of accessing information through different digital tools, both to younger generation and to the older ones. However, such access has changed not only the way to raise the cultural and entertainment contents, but also how to use them.

More and more often we participate in forums, chat rooms, instant messaging, blogs, news groups to learn and communicate; subscriptions to social networks are increasing as people want to share opinions, knowledge, and reflections. The “Digital Learning Environments” (DLE) are technical solutions to support learning, teaching and study activities. The development of an effective environment is not an easy task. The challenge is to implement a DLE which could use technology in a creative and ingenious way to solve problems and meet the needs of the different educational and cultural contexts.

The involvement of students in learning environments Web 2.0, in contrast to what happens in the e-learning platforms (Learning Management System), which are characterized by a lack of flexibility and poor performance, has led the focus on the free environments of the network, both in what concerns the interaction design of interfaces, and for the variety of tools, functions and available resources.

LiveCampus, a participatory and generative environment where the social and educational needs of the students can meet, allows the activation of the cognitive processes in a free and autonomous way, by choosing which resources to use, which sources to share without being evaluated and for that reason students considered LiveCampus an excellent supplementary tool for the teaching-learning process.

These findings have led to consider that, despite the participation on social environment is far higher than the one on the teaching platform, the students continue to require the presence of the teacher as a guide and a stable point of reference.

Directions and suggestions provided by the teacher are essential to the student, as they allow the access to the didactic environment.

The role of the teacher together with the social environment are the starting point for the optimization of LiveCampus tools. The hierarchy between teachers and students is overcome and everyone can generate knowledge, in fact, the task of the teacher is to provide the input to access didactic contents within the platform, but it is only through the dialogue and the confrontation that the learner can build a meaningful learning.

In conclusion we can assume that the research conducted with the social learning platform LiveCampus has highlighted how the learning process occurs in an autonomous but still collaborative way.

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## ENDNOTES

1. The CENSIS/UCSI report has been published on October 3rd 2012.
2. In computer science the term *cloud computing* refers to a collection of technologies that allow, typically in the form of a service offered by a provider to the customer, store and / or process data (via CPU or software) through the use of hardware / software resources distributed and virtualized in the network. Definition from [http://it.wikipedia.org/wiki/Cloud\\_computing](http://it.wikipedia.org/wiki/Cloud_computing)
3. 10° Rapporto Censis/Ucsi sulla comunicazione «I media siamo noi. L'inizio dell'era biomedica» [http://www.censis.it/10?resource\\_50=117770&relational\\_resource\\_51=117770&relational\\_resource\\_385=117770&relational\\_resource\\_52=117770&relational\\_resource\\_381=117770&relational\\_resource\\_382=117770&relational\\_resource\\_383=117770&relational\\_resource\\_384=117770](http://www.censis.it/10?resource_50=117770&relational_resource_51=117770&relational_resource_385=117770&relational_resource_52=117770&relational_resource_381=117770&relational_resource_382=117770&relational_resource_383=117770&relational_resource_384=117770)
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10. [O'Hear, 2006] Elgg – social network software for education – Steve O'Hear – August 11, 2006 - <http://www.readwriteweb.com/archives/elgg.php>
11. [Yarmosh, 2006] Smart Social Networks – Ken Yarmosh – July 26, 2006 [http://www.readwriteweb.com/archives/smart\\_social\\_ne.php](http://www.readwriteweb.com/archives/smart_social_ne.php)
12. Folksonomy is a neologism that describes a categorization of information generated by users through the use of keywords (or tags) freely chosen. The term is composed of two words, folk and taxonomy; therefore, a folksonomy is a taxonomy created by those who use it, based on individual criteria.

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