

# Collective Intelligence and Online Learning Communities

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**Abstract**—Information society brings new forms of communication models where citizens live with multiple digital identities on nomadic online communities. These collectives are capable of interact themselves to create new forms of knowledge sharing experiences and recycling old fashioned model of information management, and thus creating learning communities through informal practices. In this paper we analyze these digital communities representing new forms of learning styles and new approaches for open knowledge as a new trend for the next decade society

**Keywords**—eLearning, knowledge management, online communities

## I. INTRODUCTION

One of the most interesting and successfully outcomes of the current information society is the creation of online communities: *group of people with a common interest or a shared purpose whose interactions are governed by policies in the form of tacit assumptions, rituals, protocols, rules, and laws and who use computer systems to support and mediate social interaction and facilitate a sense of togetherness* [1]. The fastest grow of communication technologies offers an envisioned model of digital interconnected society, weaving the Web 2.0 as a *technocratic* concept, focusing the attention on the individual as an active participant involved in a collectivity, and sometimes related to the success of recommendation systems (*Amazon, eBay*), leisure (*YouTube, Haboo, Flickr*) or meeting points (*Facebook* or *Twitter*).

These citizens have a Digital Identity, term describing the person as an individual presence across all the digital communities in which he or she is represented. *Your Digital Identity is everything you create on the Web, but also what other people might say about you there* [2]. Each one of these Digital Identities has their own dimension and purpose: your email ID, your bank account, the social network, e-commerce, libraries, etc. These fragments of your profile (public as well as private) are part of your social identity, a set of individuals with common social interest, features or goals. Nowadays, the importance of communities is based on the relevance of the digital identities involved within. For instance, *Myspace* was the largest online social network on 2007 with more than 100 million of regular users worldwide creating pages representing

their identity and creating networks of links to other users by adding them as friends. On January 2011, *Facebook* has been considered the largest community with more than 600 million active users. The digital life in social networks, searching on web browsers or sending mails are examples of how your personal preferences and activities are analysed and used by technological engines. The footprint of any activity you perform on the digital life is seems like a waves that maintain your current activity alive and it can be used to predict or recommend something to others. For instance, *PageRank* is a well-known algorithm to analyse the relevance of a document calculated [3] by with people's subjective idea of importance, and thus predicting the user behaviour. A commercial side effect of this technique is the *GoogleAds*, smart recommendations included on pages suggesting products or information we may be interested. These concepts are also related to how people can learn from others. The relevance of how other people's activities are part of the context of one's own activities is crucial to understand new form of social relationships or implicit knowledge, also called social-aware computing [4]. This is a non-formal and implicit knowledge, which is widely spread by digital media to affect (directly or not) to other users. Related to your identity, new forms of social features are identified such as the trust, reputation or popularity. For instance, a new blog site with growing popularity may change the reputation of the individual and their community supporting them. Learning from other's activities and tasks is implicitly represented in the digital society with lots of "smart links" supporting the connectivity (following conversations on twitter, adding friends to social networks, or sending suggestions to others).

These new forms of implicit knowledge and non-formal learning represent a new paradigm called *collective intelligence* (or the wisdom of crowds) a shared or group intelligence that emerges from the collaboration and competition of many individuals, that is, *a form of universally distributed intelligence, constantly enhanced, coordinated in real time, and resulting in the effective mobilization of skills* [5]. P. Lèvi identifies such phenomenon as a new model of economy of human qualities.

In this paper we will focus on the new ways of non-formal learning skills. Previous works focused on the technology enhanced models for virtual mobility for worldwide learning [6]. Section two identifies new frontiers in learning

communities through non-formal learning spaces and the role of educational Institutions on these changes. Section three shows current advances in open content production and their impact in these communities. Section four identifies the analogies of these living communities with a collective intelligence, and the higher education policies to promote open learning without barriers. Section five describe main goals of this research paper and next steps toward creating open educational resources supported by a collective intelligence

## II. MODERN LEARNING COMMUNITIES

Many people use technology and their digital identity for their learning activities. According to Riel and Polin [7], three overlapping typologies of learning communities are identified as shown in Fig. 1:

- *Task-based learning* where group of people are engaged working together over a limited period of time on a particular product. Different knowledge backgrounds are applied to solve a problem through collaboration and participation is often mandatory.
- *Practice-based learning*, usually based around a discipline, focus on sharing and developing good practice. Participation is usually voluntary. The focus is on how knowledge is used rather than on the process of knowledge development.
- *Knowledge-based learning*. The focus is on the use and reuse of knowledge. Some research activities are based on this topic.

These communities are also supported by means of online production systems for content management. They have relatively low barriers to entry and therefore, contributions are mostly done by volunteers who cooperate in a geographically distributed and decentralized way forming open collaborative communities [8].

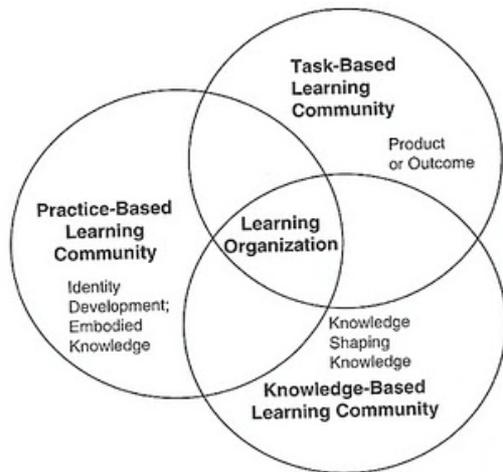


Figure 1. Typologies of learning communities

For instance, *Wikipedia* (the multilingual open-content collaborative encyclopaedia) has grown in five years to contain over two million articles in over 200 languages, and counting. Other tools such as *slideshare*, *youtube*, *panoramio* or

*googledocs* are representing true-shared *collective memories* as Maurice Halbwach view [9].

Modern online communities are also an intrinsic part of the current *nomadic* societies where mobility is a key issue in their habits for content production or learning acquisition. People spend a lot of time working and travelling from one place to another where technology allows us create new models of communication and collaboration, and that nomadic time is spent in technology-aware places. Mobility also represents a new model of learning in itself. Learning in context represents an exciting experience where contents are located. Mobile learning (m-learning) allow students to learn anywhere and at any time, enabled by mobile technologies and wireless internet connections, with an interesting feature: the continual changes of the learner’s location represents an opportunities to discover services, contents, co-learners or new different learning styles [10]. For instance, a system to support the generation of adaptive mobile learning environments is described by Martin and Carro [11] where students and teachers can accomplish different types of individual and collaborative activities in different contexts.

Also, traditional (educational) institutions are offering open material as an alternative or complement to traditional studies. The term online courseware is the initiative to convert course materials, originally designed for their own undergraduates, into non-credit-bearing online versions for the general public [12]. The best example is the MIT’s OpenCourseWare (OCW) initiative, the origin of the OCW Consortium [13], a wider collaboration of higher education institutions around the world creating a deep body of open educational content using a shared model, born 10 years ago. Open content and mobile learning meets in new courses paradigm such as iTunesU [14] allowing people to teach anywhere using their mobile phones or their favourite mp3 players. This challenge is nowadays a consolidated trend. For instance, the most relevant universities around the world offer high-quality audio and video recordings of a selection of popular lectures and interactive contents.

These trends coexist with dramatically changes in Higher Education, with the increase of globalization and internationalization of curricula, distance education based on information and communication technologies (ICTs) and the “world-class” phenomenon [15]. Institutions in Europe are involved in the European Higher Education Area (EHEA) as a further step towards the Bologna Process to ensure more comparable, compatible and coherent systems of higher education in Europe. This new framework constitutes a huge *online* community of European Higher Education Institutions sharing common goals, methodologies and practices based on ECTS [16].

This trend on HEI is the beginning to open up institutions to new approaches for teaching and learning. But this challenge is much more than a simple marketing tendency, with deeper implications as shown as follows:

- The audience is no longer restricted to a well-understood enrolled student population. Institutions are offering their expertise to a more general public, so your abilities for

teach and training are observed and analyzed from the outside.

- These initiatives are costly in human and technical resources. Funding needs to maintain such offer with good average of quality, and this is another problem that institutions have to overcome.
- New fears have appeared in teachers and academic staff; the awareness of technological benefits for training could kill the teaching experience [17].
- New redefinition of the missions of the university. It is clear that research and teaching are the two most important goals for institutions. However, researching was traditionally focuses on publishing (on journals and refereed books) whereas teaching was always more restricted to proprietary courses belonging to the institutions. Recognition of both activities is also unbalanced in most of the institutions.
- Students who enrol at universities expect to find much instructional material available electronically, so this is becoming as a new service offered (and demanded) by institutions.
- The role of Universities to accredit competencies is not only based on traditional degrees. Trends go towards a dramatic change for life-long learning accreditation and even considering learning contracts instead of the conventional degree.
- Universities are changing the model of publishing in the Digital Age. Nowadays regular journals or traditional books are replaced by alternative distribution models (institutional repositories, pre-print servers, open access journals) with the aim to broaden access, reduce costs, and enable open sharing of content an opened to new digital communities.

These challenges are based in fact on the successful increase of online communities and thus breaking barriers on traditional institutions and enhancing the new digital repositories of collective memory. These aims need a strong support of universities and a clear conviction that this model will allow universities to maintain their status as academia in the new digital world.

### III. TRENDS ON OPEN EDUCATIONAL RESOURCES

One of the basis for learning communities is the use and production of Open Educational Resources (OER), digitised materials offered freely and openly for educators, students and self-learners to use and reuse for teaching, learning and research. Internet and cyberspace was born with not barriers to create, share and produce services on a huge networking activity. New frontiers between informal and formal learning becomes a new paradigm for next decade due to the emerging

world of online learning communities and user-generated contents. Informal content-generation has the following pattern:

- Informal learning and spaces of knowledge increase their presence on Internet by personal blog websites and communities of practices. Questions such as “*how to...*”, “*alternative to...*”, “*things to do...*”, are easily answered simply on any search navigation facility.
- Prestige and recognition of people and topics on cyberspace are quickly translated to influence trends on the network, measured as followers, friends or “*I like it*” affirmations.
- Information in most cases is subjective (own experiences), so it is difficult to identify facts, evidences suggestions and opinions. In many cases, people are just looking for opinions. But for learning skills, it is also important to consider evidences and the know-how of such content.
- Although the user-generated content is always a non-profit activity, in many cases, there are IPR violations, just fake or spam propagation.

Educational institutions redefine their strategies on several complementary objectives:

- Internationalization policies to promote the collaboration on joint degrees, mobility and fostering cooperation between Higher Education institutions.
- The adoption of the European Qualifications Framework (EQF) as an additional and important step to achieve mobility in higher and continuing education and fostering promoting the Life Long Learning skills [18]
- Quality Assurance models through the ENQA Association, analysing for instance the effectiveness and quality of Higher Education trough their learning outcomes [19].

Both dimensions of formal and non-formal learning share common interest to promote OER, best practices and online tools for digital knowledge management. In fact, future professionals of our information society demand novel paradigm to acquire learning skills based on current topics, trends and technology, and sometimes, this means a flexible lifelong learning model based on active intelligent communities (researchers, educators, practitioners, experts) promoting effectiveness in the interchange of knowledge.

### IV. COLLECTIVE INTELLIGENCE ON LEARNING SKILLS

The opportunities offered by a native digital community mean new and revolutionary challenges in our society, and therefore, in models of knowledge transfer. Two important

issues must be taken into account to understand these approaches:

- The wisdom of the crowd. People interact themselves and promote new knowledge obtained from their experiences and enhancing it by structured digital documentation and repositories. Also they are very sensitive to new trends and opportunities in digital age.
- The expertise of the academic educators represents the excellence in the research and methodological development. They collaborate on creating common layouts and frameworks of knowledge through regular courses and degrees.

Both sides meet in the aims of collective intelligence framework proposed by P. Levy as a fully distributed intelligence that is continuously enhanced and synergised in real-time, with continuous feedback one each other. The way universities see online educational resources are changing. The words *open* and *free*, clearly related to OER and Open Educational Practices (OEP), are promoting the digital freedom in the learning experience. For those who believe that education is a common good, these advances in digital technology and collaborative authoring software are timely and welcome. The term OER encapsulates the spirit of collaboration and collective learning now possible with the open web 2.0, in particular the principles of sharing, remixing and leveraging the work of others for the benefit of society.

The university also has a commitment to society and must adapt to new ways of learning, culturally open, barrier-free economic and socially collaborative. Thanks to reforms in HE in Europe designed to flexible learning pathways and brought about by the Bologna Process, the EHEA is in a unique position to experiment developing OER into a new form of provision which merges the traditions of recognition of non-formal learning and of distance provision.

Nowadays, a number of initiatives promoted by the Lifelong Learning Programme of the Education, Audiovisual and Culture Executive Agency (EACEA)[20] will lead universities on the road of improvement of the effectiveness of teaching and learning by enhancing the quantity and quality of OER/OEP that can be incorporated into higher education and further education provision.

We can mention the OPAL project [21] whose aim is to support Open Educational Practice in the sense of address the whole OER governance community: policy makers, managers and administrators of organizations, educational professionals and learners.

Other project that we can mention is OERtest [22] whose mission is to create a framework for provision of OER within Europe by the development of quality standards, assessment guidelines, financial models, curricular provisions and any other administrative requirements necessary to allow for HEIs within the EU to assess learning received exclusively through OER.

One of the first activities proposed is the creation of groups of experts (not only related to academic staff) acting as collective intelligence and adding efforts to promote certification, self-assessment and stimulating mutual understanding of technology possibilities and the need of open high quality contents accessible for our nomadic digital society.

## V. CONCLUSIONS AND FUTURE WORK

Online communities represent a new form of virtual organisation promoting sharing knowledge and learning. This is a common trend in the information society where people live with different digital identities using technology as a nomadic culture for everything on everywhere.

Our main goal is the identification of best practices in online learning communities in order to promote Open Educational resources for different purposes: self-assessment, certification, curriculum development, etc. Future works will be oriented on analysing interviews with stakeholders and testing the usefulness of these high quality open content for wider lifelong learning communities.

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